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USSR Report

ENERGY

No. 115

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CONTENTS

ELECTRIC POWER

NEW TAJIK POWER TRANSMISSION LINE COMPLETED

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 18 Jun 82 p 1

[Article by N. Popov from Nurek: "The Birth of a Power Transmission Line"]

[Text] As we have already announced, recently the second stage of the 500-kilovolt power transmission line running from the Nurek GES to the Tajik Aluminum Plant went on line. This event has taken a worthy place among the major stages in the development of the Southern Tajik Territorial-Production Complex [TPK]. Our stringer N. Popov has furnished these details from the site of the event.

...A loud bang from the switches and the emergency signal stopped the final starting-up work. The operating personnel quickly discovered the reason for the unexpected shutdown of the power line going into operation, and to the ringing of the dispatcher telephones, the installers and operating workers of the Nurek GES celebrated their first victory as the safety equipment had operated correctly!

The second line stood just 46 minutes under power. The accumulating storm in a burst of lightening ran along the tautly stretched wires of the power transmission line, causing an overload. But the complex safety relay equipment instantaneously responded to the abnormal phenomenon and shutdown the line, preventing an emergency.

A week after the first connecting, when all the tests had been completed, the experienced installer from the All-Union Gidroelektromontazh [Hydropower Electric Installation] Trust V. Lyul'chak made the last notation that all the automatic equipment was fully ready to operate. For him the completion of a new line was an ordinary event. But for his student Ivan Stonogin, this work was a testing of maturity and skill. The young installer passed it with a grade of "excellent."

"The 500-kilovolt powerline," said Stonogin, "is my second. I began my first also here in Nurek. But then I was a novice. Several years have passed since then and I have gained work experience on the Toktogul' GES in opening up a 220-kilovolt line. The second link between Nurek and Tursunzade has been a good testing of my knowledge and has enriched me with experience in installing complex equipment."

The operators of the Nurek GES carefully accepted the relay safety equipment and automation after installation. At times along with the installers they worked until dark over the difficult plans. But for someone like G. Levanova, an electric installer

from the Electrical Engineering Laboratory of the Nurek GES, there is no lack of experience and skill. She has had years of work at the Krasnoyarsk GES. She has worked in Nurek since the starting up of the first unit. Along with the installers during these crucial days she is sharing still another major labor success.

The new Nurek--Tursunzade power bridge is in operation. It will make it possible for the flagship of Tajik power to release the floodwaters of the present year through all the plant's units. This will lead to a reduction in the proportional water consumption for generating one kilowatt hour of electric power. The new 500-kilovolt power transmission line will increase the operating reliability of the entire Central Asian power system.

10272
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ELECTRIC POWER

NEW PRODUCTS, SYSTEMS AT ARMENIAN ELECTRICAL PLANT REPORTED

Yerevan KOMMUNIST in Russian 30 May 82 p 1

[Article by KOMMUNIST stringer T. Nersisyan: "A Contribution to Power Engineering"]

[Text] The workers and specialists from the Armenian Specialized Division of Energoset'proyekt [Power Grid Design] are approaching the glorious jubilee of the 60th anniversary of the formation of the USSR with labor successes. The enterprise workers marked the past shock week devoted to the valorous Soviet Border Troops with highly efficient work.

Over 20 different types of products are produced in the enterprise's experimental production. During the second year of the Five-Year Plan, the clients will receive more than 2.2 million rubles of products. Basically these are electronic devices for power plant automatic control systems, that is, the connecting link between the ASU [automatic control system] and the plant. For now the electronic ITs [abbreviation unknown] system with an expensive imported videot[r]on has not been taken out of production, but an analogous experimental IPGTs unit has been designed and manufactured and this consists completely of Soviet-produced parts.

Production has been started on a "modular-design dispatcher's work area" used on modern power projects and greatly simplifying the control of power plant operations. This unit has been shown at the USSR VDNKh [Exhibit of National Economic Achievements] and has been highly praised by specialists. In terms of technical specifications and design, it fully meets the international standard. The economic effect from its use will be over 240,000 rubles a year. Also designed and in production is a "TV display system for data on the frequency and power of electric current in a power system's grids" ("Soti") and this will make it possible to save up to 180,000 rubles a year. Work is being continued on designing a "warning and data system for ice formation on high-voltage power transmission lines" which is so necessary in the northern latitudes of the nation. A "relay safety monitoring and control system" is in the design stage and this will employ microelectronics, and all the equipment will be located in modular transportable units.

At the enterprise a great deal of attention and effort is given to the designing of various types of power plants and high-voltage power transmission lines. During the days of the shock week, work was completed on designing power transmissions lines and compressor electric substations for a shock construction project of the 11th Five-Year Plan, the Urengoy--Novopskovsk Gasline. This will also run across the territory of

Saratovskaya Oblast which is served by the Armenian division of Energoset'proyekt. The substations and high-voltage power lines are being designed for major construction projects in the republic: the Idzhevan--Razdan railroad line and the Charentsavan Lift Truck Plant. The plans are being completed for the reconstruction and expansion of a 220-kilovolt substation in the village of Lichk in the Rayon imeni Kamo.

The enterprise workers have promised to fulfill the annual plan by 22 December.

10272
CSO: 1822/211

ELECTRIC POWER

CONSTRUCTION PROGRESS ON HIGH-VOLTAGE POWER LINES REPORTED

Moscow IZVESTIYA in Russian 7 Jun 82 p 2

[Article by IZVESTIYA correspondent V. Shchepotkin from Pavlodarskaya Oblast: "The Power Bridges of the Five-Year Plan"]

[Excerpt] Two rays diverging from one point in the northwest of Kazakhstan mark the map for power construction in the 11th Five-Year Plan. The point where they originate is an enormous fuel treasure house, Ekibastuz. And the rays are unique power transmission lines [LEP] about which the decisions of the 26th CPSU Congress state: "To put into operation the first stage of the direct current power transmission line with a voltage of 1,500 kilovolts running between Ekibastuz and the Center and an alternating current power transmission line with a voltage of 1,150 kilovolts between Ekibastuz and the Urals.

The billions of tons of coal located comparatively close to the earth's surface and mine not by shaft mines but by strip mining have made the fuel from the fourth national boiler room, as Ekibastuz is now called, the cheapest in the nation. But the abundance of power raw materials and particualrly the pace of its mining, when just one mine produces 90 tons of coal every minute, have necessitated a search for the most economic ways to utilize the fuel. At present only one quarter of it is burned on the spot, approximately the same amount is consumed by the power plants of Kazakhstan, while the remainder is transported to the Urals and Western Siberia. One can imagine the load on the transport arteries of the nation if Ekibastuz each day dispatched around 3,000 coal-loaded railroad cars. For this reason, according to the estimates of economists, it is much better to utilize the basic portion of the fuel on the spot, in burning it in the furnaces of power plants built near the "energy treasure house" and transmit the current over long distances than it would be to transport the compressed energy in railroad cars. Precisely this has caused the construction of a whole series of TES (thermal power plants) in the Pavlodar Irtysh Area with a total capacity of 20 million kilowatts. And it is up to the two super-powerful power transmission lines to transport the gigantic amount of energy to the industrial regions of the nation.

Both power bridges are unique and are being built for the first time in the world by the USSR. The first of them with a voltage of 1,500 kilovolts will receive current transformed from alternating into direct immediately at the sources of the electric stream in Ekibastuz and will carry it almost 2,500 kilometers to the center of the nation. At present the collective of the Tselinelektroset'stroy [Virginlands Electric

Grid Construction] Trust is building the first section of the unprecedented power bridge. Two detachments, moving toward each other across the territories of Pavlodarskaya and Tselinogradskaya oblasts, are laying the foundations and erecting the multiton supports on them, each of which in height is comparable with a medium-sized TV tower. Even this year wire will be installed on a ten-kilometer segment for strength testing.

However at present in terms of importance the other super-powerful power bridge is in the forefront. This is the alternating current 1,150 kilovolt transmission line. While the direct current transmission line is a transit line, this ray from the Ekibastuz power cascade over the path to the Urals should provide power to intermediate consumers. This year the construction workers should complete the first section from Ekibastuz to Kokchetav. On a multikilometer section, wire has been installed and in the future year the Pavlodar Irtysh Area will produce current over the first span of the super-powerful power bridge.

10272
CSO: 1822/211

ELECTRIC POWER

RURAL POWER CONSTRUCTION IN PAMIRS DESCRIBED

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 17 Jun 82 p 1

[Article by KOMMUNIST TADZHIKISTANA correspondent N. Dzhonbabayev: "The Power Transmission Line Marches Over the Mountains"]

[Text] The first electric supports from the Kirghiz settlement of Sarytash have reached the farms of Shugnanskiy, Murgabskiy and Ishkashimskiy rayons located in the Alayskaya Valley.

The electric power from the Kirgizglavenergo [Kirghiz Main Power Administration] System over an 11-kilometer high voltage line will replace the energy of the small diesel plants in the Pamir livestock raising settlements. It will be used not only for the household needs of the sheep and yak raisers but will also make it possible to electrify and mechanize the farms here.

The construction and installation of the power transmission line in the cloudy region are being carried out at present at a particularly high pace. Workers from the Khorog PMK [mobile mechanized column] of the Tadzhiksel'elektrostroy [Tajik Rural Electric Construction] Trust, in responding in deeds to the decisions of the May plenum of the CPSU Central Committee have promised to complete this line ahead of the designated date.

High labor productivity in installing the electric supports and stringing the cables has been achieved by the mechanized brigade headed by the experienced power construction worker Dzhumabek Atambekov. "Electric Power on Time for the Livestock Farms!" under this motto another brigade from the same PMK headed by Chorshambe Kel'diyev is at work in the Pamir Mountains. This brigade is building a power transmission line in the alpine Dzhavshangoz Valley. The electric installation workers have successfully completed the construction of a ten-kilometer line here and have begun installing low-voltage equipment on the farms, in the housing, the district hospital and other public buildings located at the central camp of the livestock raisers.

The reconstruction of the Khorog--Vir line of more than 60 kilometers is being successfully continued in the Pamir. It will supply electric power to the mountain villages and the large agricultural projects located in Gunt Gorge. This year the laying of new power arteries for the villages and livestock farms is also to be carried out in Rushanskiy and Kalai-Khumbskiy rayons.

The power construction workers fo the oblast, together with the collective of the Dushanbe Mechanized Column No 1 from the Tadzhiksel'elektrostroy Trust must build more than 70 kilometers of new power transmission lines in the farms of the Pamir and reconstruct 55 kilometers of old lines, using more than a million rubles of capital investments.

10272
CSO: 1822/211

BRIEFS

NEW POWER LINE--On 3 June, the second stage of the 500-kilovolt power transmission line running from the Nurek GES to the Tajik Aluminum Plant went on line. Thus, yet another power line of the Southern Tajik Territorial-Production Complex [TPK] has begun operating. At this construction project, the "Worker Relay" has again demonstrated its mobilizing force. Comrades from Samarkand, Chimkent, Tashkent, Barnaul and Ust'-Kamenogorsk came to aid the installation and construction workers of the Dushanbe Mechanized Column No 50. Metal structural elements, cable, insulators and accessories have arrived continuously from Domodedovo, Chirchik, Blagoveshchensk and Yuzhno-Ural'sk. At present final preparations are underway to turn over the 500-kilovolt power line to he state commission. Completion is planned for the end of June. [By V. Bol v] [Text] [Dushanbe KOMMUNIST TADZHIKISTANA in Russian 5 Jun 82 p 1] 10272

DNEPROGES POWER LINK--The new 330-kilovolt transformer substation can be called a duplicate Dneproges [Dnepr GES]. The first stage of the substation has gone into operation on the right bank of the Dnepr not far from the pioneer of Soviet power engineering, the Dneproges. The Zaporozh'ye scientists have proposed that the existing 330-kilovolt power line be used as the main source of power for the new project. This line transmits capacity from the Zaporozh'ye thermal GRES to the Dneproenergo [Dnepr Power] System and runs near the hydropower plant. Two large 500-meter busbar bridges have linked the open-air bus-and-switch structures of the substation and Dneproges. Now at any moment it is possible to have 100-percent back-up for the industrial loads of this center. With the completion of the right bank substation, the problem of shutting down the plant's units for repairs will be solved once and for all. The flexibility of load control will make it possible without any special difficulty to alter the operating schedule of Dneproges in the event of a shortage of water supply in the upper Dnepr. [By A. Siroukh, Engineer from Zaporozh'ye] [Text] [Kiev RABOCHAYA GAZETA in Russian 13 Apr 82 p 2] 10272

HYDROPLANT CONTROL SYSTEM--The automated dispatcher control system worked out by the specialists will ensure precise cooperation among the various services in building the Boguchany GES. The fourth hydropower plant on the Angara will have a dam that is not similar to the previous ones. It will be a combined dam of concrete and rock fill. In order to build this barrier 2.5 kilometers long, some 2,267,000 cubic meters of concrete had to be laid and the volume of earth moving will be 54,390,000 cubic meters. Such an amount of work necessitates a particularly precise organization of production. How can this be achieved? Concrete laying and earth-rock moving are created with a single dispatcher service. According to pre-

liminary estimates, the introduction of the ASU [automatic control system] will make it possible to significantly raise labor productivity in comparison with the planned. [By ISVESTIYA correspondent L. Kapelyushnyy, from Irkutsk] [Text] [Moscow IZVESTIYA in Russian 11 Jun 82 p 3] 10272

RECONSTRUCTION OF DNEPROGES--The USSR Minister of Power and Electrification P. S. Neporozhniy has signed an order for the fundamental reconstruction of the Dnepr Hydropower Plant imeni V. I. Lenin. The turbine room of the plant's first stage was designed in the 1920's and the units with a capacity of 72,000 kilowatts and a total of 650.5 megawatts can no longer satisfy today. Just compare: in the second turbine room the units have a power of 104,000 and 330,000 kilowatts, and here total capacity is almost 900 megawatts. The old units will be replaced by modern, more productive ones so that the first turbine room will generate double the electric power, some 1,200 megawatts. The reconstruction plans are being worked out by the Khar'kov Institute Ukrgiproproyekt [Ukrainian Design Institute for Hydropower Plants], the same that produced Dneproges No 2. The plant, the veteran of Soviet power engineering, will go through a fourth youth. And here it is highly symbolic that Dneproges imeni V. I. Lenin which was built by the entire nation will begin its rebirth during the year of the 60th anniversary of the formation of the USSR. [By a RABOCHAYA GAZETA correspondent from Zaporozh'ye] [Text] [Kiev RABOCHAYA GAZETA in Russian 3 Apr 82 p 3] 10272

EKIBASTUZ POWER PLANT--The first of the thermal power plants which will operate on coal from the Ekibastuz Deposit is picking up steam. Today they have put into operation the fourth power unit at the Ekibastuz GRES-1. With its starting up, construction on the first stage of the plant will be complete and the designed capacity here reaches two million kilowatts. The competition following the principle of a "worker relay" has provided a high-construction pace. The relay was joined by collectives from over 100 supplier enterprises. They have organized precise delivery of equipment, structural parts and pieces to the project. [TASS correspondent A. Gurskiy from Pavlodar] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 Jun 82 p 1] 10272

EKIBASTUZ GENERATING CAPACITY--Assembly of the fifth power unit of 500,000 kilowatts has been completed at the Ekibastuz GRES-1. The electrical equipment was turned over to the installers precisely on schedule. [TASS, Ekibastuz] [Text] [Moscow IZVESTIYA in Russian 4 Jun 82 p 1] 10272

URENGOY POWER PLANT--The first group of construction workers has reached the destination on the left bank of the northern Pur River. In time here the building of the powerful Urengoy GRES will go up and this will operate on the natural fuel from beneath Yamal. The tapping of the oil and gas areas of Tyumenskaya Oblast requires evermore energy. The participants in the construction of one of the most important projects in the Far North have put their dwelling vans on the right bank of the river, they have laid out the equipment and begun the first work. [Yu. Perepletkin, IZVESTIYA correspondent] [Text] [Moscow IZVESTIYA in Russian 6 Jun 82 p 1] 10272

ANGARA RESERVOIR FILLING--The water level in the reservoir of the Ust'-Ilimsk GES has reached its planned mark. This will ensure the successful operation of the power plant during the navigation season on the Angara. The present winter in the

Angara area has been without much snow. The power workers were concerned whether the flood waters would fill the artificial sea. But generous nature has not failed. The tayga rivers have provided sufficient quantity of water. [By A. Shafranovskiy, PRAVDA stringer from Ust'-Ilimsk] [Text] [Moscow PRAVDA in Russian 23 May 82 p 1] 10272

SAYAN HYDROPOWER RESERVOIR--With the May flowering of the bird cherry, the long expected flood related to the heavy arrival of "native" water has reached the dam of the Sayano-Shushenskaya GES. The hydraulic power construction workers and operators were ready for it. At present each day the reservoir in the Sayans receives 500-600 million cubic meters of water. The flow of electric power is also growing. Yesterday the plant delivered to the unified power system some 42 million kilowatt hours and this was several fold more than in the winter days. The six units operating employ not more than one half of the daily influx of water. The remainder goes to make up the annual store of the reservoir. There will be no unproductive release of water. [By S. Yezhov, PRAVDA stringer from Abakan] [Text] [Moscow PRAVDA in Russian 28 May 82 p 2] 10272

RURAL POWER SUPPLY--The last diesel plant in the alpine Rushanskiy Rayon of the Pamirs has been written off. Today the farms and houses of the mountain dwellers received electric power from the Vanch GES. The electric power of the GES will increase the efficiency of agricultural production and improve the life of the mountaineers. In their homes electric stoves and heaters will be installed and these will replace the traditional hearths. [By TASS, from Rushan, Tajikistan] [Text] [Moscow IZVESTIYA in Russian 13 Jun 82 p 2] 10272

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ENERGY CONSERVATION

POORLY BUILT HEATING GRIDS EVENTUALLY CAUSE BIG ENERGY LOSSES

Moscow STROITEL'NAYA GAZETA in Russian 7 May 82 p 2

[Article by A. Brodskiy, chief specialist of Ukryuzhgiprokommunstroy [State Institute for the Design of Municipal Construction in the Southern Ukraine]: "A Little Particle of Heat"]

[Text] Heat must be saved. Yet there is, perhaps, no waste that is larger in scale and less monitored than that of heat.

Placards and slogans in almost every boilerroom and at the TETs's tell you that a drive is on here to save even tenths of a fraction of a percent of fuel resources. Automation, engineering improvements, operating discipline and secondary resources--all these have been pressed into service to save where fuel directly yields its precious calories. But now these calories have gone into the transport system, or, in other words, into the heating grid. Which managers can guarantee that, in the areas subordinate to him, the heating-grid pipes, hidden in deep ducts and ditches, do not lose heat above the standard, designed 1½-percent!

Inspections and individual monitoring measurements made at Odessa heating grids that had recently been put into operation showed that even 10 percent losses of the heat are not the maximum.

It is simply impossible to determine total losses of calories in the grids because of the lack by most customers of metering instruments. The main cause of the losses is damage to pipes and thermal insulation during construction. Anticorrosion protection carried out with poor quality not only does not prevent corrosion but even speeds it up. Specialists have noted that even small corrosion damage helps to promote moistening of the thermal insulation, and it is not far from there to outright leakage. Heat losses in the grids reach such proportions that they at times outshadow the whole fuel saving obtained locally in generating heat.

I want to quote a fresh document, "Recommendations on Saving Thermal Energy and Fuel," of the Moscow Academy of Municipal Services imeni K. D. Pamfilov: "Increased heat losses in the grids can be the consequence of low-quality construction....The anticorrosion protection of the pipe, the quality of the thermal insulation, and the finishing of the joints of the conduit should be subjected to a special inspection. An effective technology for protecting the steel pipes of the heating grids against corrosion with izol and organosilicate paint has been created. Only a bit remains to be done: obtain the desired result.

Last year 6 kilometers of heating grids were built in Odessa, including those of such large diameters as 500, 600 and 700 millimeters. Nineteen kilometers of heating grid that became unfit for use in a period much shorter than standard were replaced by new pipe. Total: 25 kilometers. The work was performed mainly by the forces of SMU-18 [Construction and Installing Administration No 18] of Odessgrazhdanzhilstroy [Odessa Trust for the Construction of Nonindustrial Buildings and Structures and Housing] and SU-600 [Construction Administration No 600] of Yuzhgidrospetsstroy [Trust for the Special Construction of Hydraulic-Engineering Facilities in the Southern Economic Region].

As a specialist I take it upon myself to say boldly: there is not one section of the new heating lines where the anticorrosion protection will be carried out in accordance with the strict requirements of the design and standardizing instructions, I repeat, not one!

Against the remarks which, possibly, the performers of the work are ready to present against me, I am ready to show only one argument. Each year in Odessa a million rubles are spent on the premature relaying of heating grids. This money was not envisaged by any standards. It is our payment for wastefulness.

Haste, making up for lost time, driving for percents of output to the detriment of quality, and a lack of daily operational monitoring--these are the basic causes of violation of the technology.

Almost everywhere insulation is reduced down to daubing with primer over dirt and corrosion, instead of the application of two layers of izol to a surface that has been exposed down to the bare metal. There are cases of the use of pipes that do not meet the designs in grade of steel or of reinforced-concrete conduits that have been made in accordance with drawings that have been canceled.

Is it possible to prevent the disaster that is hidden in the quiet, inaudible ducts of underground mains? For ahead there are still tens of kilometers of heating lines that are awaiting rebuilding or that are planned for construction. It can be prevented. For this purpose, it is necessary to increase efficiency of the consideration of construction affairs in the people's control committees, and, if necessary, in the prosecutor's office.

No criteria of any kind can require the acceptance of heating grids because of situational considerations. Not even those for morale: there is no spectacle more distressing in city blocks than that of green lawns, which are not even a year old, being torn up.

11409
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ENERGY CONSERVATION

RAILROADS SHOULD BE RESPONSIBLE FOR COAL LOST EN ROUTE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Jun 82 p 2

[Article by V. Potapchuk (Kemerovo-Novosibirsk-Moscow): "Caps of Darkness"]

[Text] Strict accounting for fuel and energy.

The Kemerovougol' [Kemerovo Coal Production Association] is specialized in the output of such things. You don't believe it? Let's visit...let's say, TETs-22 of Mosenergo [Moscow Regional Power Administration]. A train with fuel has just arrived here. The travel papers say it in black and white: cars with "caps." Even the height is indicated--45 centimeters.

"We have not actually seen them," complains TETs department chief A. Shkalikov. "We start to weigh the load--we find a shortage of 2 to 10 tons per car. Most likely the 'caps' simply were not loaded on."

No, it is not proper to assume that. What if the "cap" had been blown away by the wind, or the coal had been spilled off along the way? Just what are the actual losses during haulage? Deputy USSR Gosplan Chairman A. Lalayants said in the press that it was 10-15 million tons. But other figures have also been named. In order to introduce at least some clarity, I conducted a little experiment for this editorial-board task.

In the Kuzbass [Kuznetsk Coal Basin], at the Krasnobrodskiy Strip Mine, 26 cars were loaded up and carefully weighed. The coal was poured in with "caps" ½-meter high and was painstakingly compacted with a roller. At Mosenergo's GRES-4 the cars arrived practically without "caps." As the monitoring weighing indicated, 27.5 tons had disappeared. Note that in our experiment the coal had been compacted, which is not always done by far. But nevertheless an average of more than 1 ton per car had been lost. Simple calculation shows that A. Lalayants was right, the losses are not a bit less than 10-15 million tons per year.

It is not a joking matter. Underground coal miners, it happens, work without days off, the power workers struggle to save an estimated fraction of a gram per kilowatt hour, yet millions of tons disappear without a trace along the line. What is to be done?

Fortunately it is not necessary to invent or dream something up here. A solution to the whole problem could be found in USSR Minugleprom [Ministry of Coal Industry] files, in yellowing reports about a remarkable experiment in economics.

It had been established for a long time that coal workers would weigh the load prior to dispatch and would bear pecuniary responsibility to the customer for a shortfall. However, losses were occurring en route, that is, on a link over which the coal workers had no influence in any way. In the middle of the 1960's matters were organized differently in the Kuzbass in the form of an experiment: the railroad began to be responsible for preservation of the freight en route. It began to accept the coal by weight and to turn it over to the customer also by weight. It is true, the experiment did not cover all the Kuzbass's underground coal mines--a portion of them sent coal the old way. But this also was good: it was possible to compare graphically just which procedure was better--the old or the new. In literally a year it was demonstrated that the new way was better: losses of fuel that the railroad had accepted by weight proved to be 2.5-fold less than previously.

It is instructive to find out what a gigantic benefit was achieved through this. It became a matter of first priority for the railroad to turn suitable rolling stock over for loading. In the year preceding the experiment, tens of thousands of flatcars had been sent for coal. Understandably, not much was left on them when they reached their destination. In the first year of the experiment the turnover of flatcars was reduced 11-fold, and in another year they were entirely eliminated from circulation. While earlier no one had even heard about the railroaders themselves criticizing the cars sent for loading, now the weighers began to return defective or holey rolling stock by the thousands. And when your brother railroader rejects cars, you do not argue with him. Whether you want to or not, the cracks must be blocked.

Unfortunately, the experiment did not last long. Why did it die off? More about that later....But for the time being, let us return to the present practice. The chief of USSR Minugleprom's Transport Administration, G. Anonasenko, cited for us a fresh case. At the Debal'tsevo Railroad Yard the people's controller had discovered 70,000 tons of coal. Whose was it? No one's. The track men, being precise people, regularly gathered trash from the line. But this was not trash--it was coal. And so a hill of not very temporary storage of fuel grew up. This means that the railroad is, as before, operating a sieve on wheels. According to reliable data, at least half the cars turned over for loading are in need of repair.

"And just what is a serviceable car?" chief of the Commercial Administration of MPS [Ministry of Railways] P. Polikarpochkin cross-examined me. "You can give a definition? But I cannot. For so many years now we have been demanding that a precise GOST [State All-Union Standard] be established, so that we can protect ourselves from the client's caprices."

Do you remember what a GOST is? What a GOST is for? And how it is used? The experiment showed that when the railroad answers also for the serviceability of the cars and for preservation of the freight, conflicts cease--for the very simple reason that there is no one with whom to argue.

Let's take a look now at the experiment in the light of the famous coal "caps" previously mentioned. Several years ago MPS authorized an increase in the static load on a car, that is, a load of up to 5-7 tons more than set by the technical norms. The measure indisputably is good, if it is used wisely--for with the best of intentions you cannot cram more than 70 tons of wadding into a car. The trouble is, however, the fact that the authorization shortly thereafter was converted into a mandatory directive. MPS rigidly plans the static loading for the railroads,

the task being increased each year. The chief of the Haulage Planning Division of the Kemerovo Railroad, A. Menshchikov, made a computation from which it was evident that the task for the static loading of coal is impracticable, even with an impermissible "cap."

The client falls into a hopeless predicament. Here is what Kemerovougol' Association chief specialist A. Seryy says:

"If we do not accept the prescribed static loading, the railroad will fine us a tenner for each ton short. One Kiselevskiy Strip Mine paid 230,000 rubles in the last 2 years. If we load according to the new norm, the 'cap' will swirl away and the coal will spill during hauling."

Understandably, the shippers quickly realized what was wanted of them. It makes no difference to the railroad how much coal is actually loaded--indeed it does not answer for preserving the freight. It is important to the railroad that the required weight be shown in the accompanying papers. You even have to overstate it. Chief of the railroad V. Butko says frankly when he writes to First Deputy Minister F. Shuleshko: "The systematic increase in the task on static loading is leading to the freight shippers indicating in the documents weights that do not correspond to the actual weights, which is confirmed by the monitoring reweighing and claims of the recipients."

Feeling guilty for an involuntary error, the shippers resign themselves to acknowledging the complaints about short shipment of fuel, even when the coal was lost en route. Incidentally, the fines are not so great, since only a small portion of the customers weigh the arriving coal. And often they have no scales, so they have to trust the shipping papers. The railroad carries air, the customers are short of fuel, and the coal miners are rebuked for shipping nonexisting goods--and everyone apparently is satisfied.

But what was observed during the experiment? We read about it in the report: "In answering for the delivery of coal to the customer, the railroad reexamined the technical norms for loading with a view to providing for safe hauling of the fuel. By an MPS order it was authorized to load easily blown coal to the level of the sides, or with a 'cap' no higher than 20 centimeters after compacting." If disagreements arose between the railroad and the clients, then they were quickly settled, and in businesslike fashion.

It can also be added that at that time, when the coal workers undertook the erection of rollers for compacting the fuel, and they protected the coal from blowing away, covering it on top with larger coal fractions, they prepared and applied a protective film for the "cap"--the railroaders required all this. Now they do not.

It is understandable that monetary responsibility of the railroad to the clients is not an easy thing, it is bothersome. And the railroaders did everything to discredit the experience and to curtail it. The report about the experiment contained curious details. Under the new conditions the coal workers turned over to the railroad 79 car scales and a staff of weighers. In a few years, by 1972, the railroaders had written off 24 sets of scales as metal. Enterprising supervisors of the Underground Mine imeni Volkov managed to intercept one set, they repaired the scales and are using them to this day.

And, it is confessed, I was not in the least surprised when, in a conversation with chief of the Commercial Administration of MPS P. Polikarpochkin, I was asked with concern:

"Is it that you want to write about a continuation of the experiment? It did not justify itself."

However, not everyone thinks so. Gossnab is for it, enthusiastically. For example, deputy chief of Kuzbassuglesnabsbyt [Kuzbass Administration for the Supply and Marketing of Coal] N. Zelendinov considers the procedure that existed at that time was sufficiently reliable. Chief of Minugleprom's Transport Administration G. Aponasenko declares:

"We are ready to undertake erection of the scales and to repair them, if only the railroad will accept the coal and turn it over by weight."

Chief of Coal Industry Section of the Union Gossnab S. Ostrovskiy judges unambiguously:

"The railroaders should, of course, take upon themselves responsibility for the preservation of coal en route. What is more, not just coal."

A valuable addition. In Novosibirsk, in the Laboratory for Freight Protection of NIIZhT [Scientific-Research Institute of Railroad Transport], I got this information: each year, while ore raw materials are being hauled, an estimated more than a quarter of a million tons of pure iron are lost, and loss of pellets en route has reached 6.1 percent.

What more proofs does the Ministry of Railways need?

11409
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ENERGY CONSERVATION

METHODS FOR SAVING PETROLEUM PRODUCT DISCUSSED

Moscow EKONOMICHESKAYA GAZETA in Russian No 21, May 82 p 13

[Article by A. Kovalev: "An Economic Shield Against Petroleum Product Losses"]

[Text] Saving petroleum product is one of the most important tasks associated with the solution of problems of making rational use of the country's fuel resources. A meeting in the editorial office was dedicated to this topic. Taking part in it were workers of planning organs, automotive-transport, the oil-refining industry, organs that supply materials and equipment, and scientific-research institutes. We publish a report of this meeting.

A discussion of the problems associated with saving fuel products indicated that the reserves for saving them and making rational use of them exist at all stages of processing, transport, storage and consumption.

Chief Engineer and Doctor of Engineering Sciences N. Valitov revealed persuasively the experience of Bashneftekhimzavody [Bashkir ASSR Association of Oil Refineries and Chemical Plants] enterprises in saving petroleum product during the production process.

"Each year we review our consumption norms, aking into account the achieved level of reduction of losses and the execution of new measures to save oil and petroleum product. The association's collective has adopted a counterplan for the 11th Five-Year Period with a breakdown by year, under which losses of raw materials and of finished product should be reduced by an amount equal to the annual amount of unavoidable losses planned by the association. This will be achieved through the execution of strict reporting and the monitoring of raw-materials consumption, the introduction of measures to seal tanks for storing petroleum product, improvement of the system for gathering and utilizing hydrocarbon gases, the replacement of barometric condensers by surface-type condensers, and the introduction of air-cooled condensers on the operating lines of all association enterprises that use the new, highly effective catalysts.

The association is monitoring monthly progress in fulfilling the measures contemplated and in reducing losses. An inspection-type contest for the enterprise best in reducing raw-materials consumption, in reducing losses of crude and petroleum product and in making effective use of fuel-and-power resources during 1985-1985 has been organized here.

The experience of the Bashneftekhimzavody Association in organizing the saving of petroleum product was approved by USSR Minneftekhimprom [Ministry of Petroleum Refining and Petrochemical Industry] and it was recommended for wide introduction at the industry's enterprises.

The Potential of Resources-Saving Equipment

However, it often happens that the savings that are obtained in one element can be "eaten up" by a negligent attitude toward resources at later stages of their use. The meeting's participants discussed in businesslike fashion the state of affairs in the consuming industries.

The creation of machines that sharply reduce fuel consumption became a topic of especially detailed discussion during the businesslike meeting.

V. Ya. Selifonov, chief of the Automotive, Tractor and Farm-Machinery Manufacturing Section of USSR Gosplan:

"During the 11th Five-Year Plan there is to be a speedup in development of the production of trucks with diesel engines. In order to assess the full significance of this trend, one can cite these facts: the diesel engine requires 25 percent less fuel than the gasoline engine. In other words, each Kama autoplant vehicle will save about 6 tons of fuel per year.

"Kama's second phase was turned over for operation at the start of the five-year plan. As a result, the enterprise's capacity was brought up to 150,000 diesel truck-tractors per year, and the share of diesel trucks in total output rose from 19 to 30 percent.

"Diesel-engine production is being organized at the Kutaisi plant. New capacity has been incorporated in the Tutayev plant, which is being built close to Yaroslavl'. Engines that are to be produced here have been well perfected in design and are highly economical. Also decisions have been made to start construction during the current five-year plan of a diesel plant in Yartsevo, Smolenskaya Oblast, for outfitting vehicles of the Moscow Motor-Vehicle Plant imeni Likhachev. Diesels of the new generation will save 20 percent more fuel per year than those now being produced.

"As a whole, the production of diesels in 1985 will increase 1.8-fold over 1980's."

F. V. Vasil'yev, Deputy Chief of Glavmosavtotrans [Main Administration for Automotive Transport of the Moscow City Soviet]:

"In our main administration's enterprises, the diesel vehicle fleet comprises 19 percent of the total number of vehicles. This is not very many. But its share of total freight turnover and of transport work is 60 percent. If we did not have vehicles with diesel engines and did not plan to expand our fleet of them, then the transport-operations volume planned for 1985 would require that about 50 million additional tons of fuel be consumed."

The development of dieselbuilding during the 11th Five-Year Plan can only be welcomed. But this is only one of the tasks.

"It is just as important to solve another problem," said V. Vasil'yev. "On the eve of the 11th Five-Year Plan there was much talk about converting to nontraditional types of fuel. They had in mind the wide-scale use of compressed liquefied gases and additives, particularly methanol to gasoline. Experiments indicated that this would enable up to 14 percent of the fuel to be saved without any changes in vehicle design. Unfortunately, this problem still has not emerged from the experimental stage."

The introduction of nontraditional new types of fuel is a complicated task and should be decided on an interagency basis. The USSR State Committee on Science and Technology and USSR Gossnab should unite all the efforts of the ministries and agencies concerned with this problem. This should also become an area of concern of the All-Union Society for Inspecting the Saving of Resources. And, therefore, one of the main concerns of the inspection commissions. With so much already said about inspections for savings, the question naturally arises: where do the reserves lie, or, in other words, where are the operating personnel losing?

Where Are the Operating Personnel Losing?

RSFSR Minavtotrans [Ministry of Automotive Transport] is one of the country's largest freight haulers. In 1981 hauling volume reached almost 3 billion tons. During this period 16 billion passengers were carried. New routes and new construction projects appeared. With increase in freight and passenger hauling, kilometerage is increased and fuel consumption is raised. Right now enterprises and organizations of Russia's Minavtotrans consume an average of about 8 million tons of fuel per year. What is being done to economize on it? V. I. Kras'ko, chief of Rosavtotopenergyresursy Association answered this question in particular:

"We consider that it's up to each driver, speaking about the importance of saving gasoline. A booklet prepared in 300,000 copies tells how it is possible to save. This question is often raised: are not our consumption norms, which enable drivers to sell gasoline, and often even to pour it, too favorable...?

"It is not just a matter of norms here. It is necessary to reject the 'ton-kilometer' evaluative indicator, which right now is motivating both for the driver and the motor-transport enterprise but does not give the national economy as a whole anything. This indicator must be transferred to the ranks of the computational indicators. Then the driver is not required to inflate the tons of freight that were not actually hauled even 1 kilometer. And indeed, it is precisely because of this that fuel surpluses are formed, and 'inflated' savings that are obtained lead to fuel losses and pave the way for misappropriation of fuel. It is necessary to increase the responsibility of the freight shipper for inflating reports. And, of course, the system of fuel-consumption norms needs further improvement."

Quality and the Sphere of Operation of the Norms

N. V. Simonenko, chief of a USSR Gosplan subsection:

"Since 1974 USSR Gosplan has been approving the basic norms for gasoline and diesel fuel consumption by type of work and make of motor vehicle--the so-called linear norms. During the past 7 years consumption norms have been cut almost in half--from 200 grams per ton-kilometer to little more than 100 grams.

"Thus the system of norms has been oriented to those who operate transport. But the vehiclebuilders, for example, did not receive concrete tasks to create vehicles with less fuel consumption. Right now the system for setting norms has been restructured in such a way that tasks for saving for a given vehicle are refined at the design stage. And this benefit is called for in the plan for balancing the production and the consumption of petroleum product.

"The range of petroleum product subject to norm-setting at the USSR Gosplan level has been expanded. This relates, in particular, to the establishment of norms for lubricating-oil consumption. Norms for the consumption of fuel by construction and roadbuilding machinery and mobile electric-power plants with internal combustion engines require improvement."

S. P. Kras'ko: "The setting of norms for lubricating materials must be solved simultaneously with standardization of them. Transport enterprises right now must have 32 types of oil. Why such a heap of them?

"Practically every vehicle works on just its 'own' oil. Why not unify them, why not produce, let's say, a limited number of types of winter oils and summer oils? Cannot USSR Gosstandart [State Committee for Standardization] put an end to this lack of coordination?"

A. K. Yaroshenko, chief of an administration of Goskomsel'khoztekhnika [State Committee for Supplying Production Equipment to Agriculture] of the Ukrainian SSR:

"I support the comrades who raised the problem of the diesel oils. A wide assortment creates great complexity in their production, and, consequently, also in satisfying the requirements of the farms. The instructions on tractor operation, for example, call for the use of MG-10-2 oils. But the operators are forced to violate the rules because there are not enough of these oils. Replacing it with another type leads to overconsumption of a valuable product and premature engine wear."

N. P. Khalyavka, manager of the VNIIPKneftekhim Laboratory (Kiev):

"Representatives of RSFSR Minavtotrans and Ukrainian SSR Goskomsel'khoztekhnika touched upon the question of setting norms for oils, of unifying them, and of saving them. USSR Minneftekhimprom has created a special laboratory that is occupied with these problems.

"We have established a number of causes that give rise to great oil consumption. First of all, the poor seal of friction components in the vehicles being produced should be named. Because of this it would be worthwhile to support the initiative of the Onega Tractor Plant, which, along with improving the design, took the route of replacing liquid oils with lubricant greases, which enable lubricant consumption to be decreased.

"Oils are being unified right now. The solution of this question is running into opposition on the part of the manufacturers. USSR Gosstandart should actively speak its piece here. The practice that permits each developer or manufacturer to incorporate 'his' oil in the design must be broken up."

The Responsibility of the 'Sel'khoztekhnika'

V. A. Novichikhin, chief of the petroleum inspectorate of the Voronezhskaya Oblast Administration of RSFSR Goskomnefteprodukty [State Committee for Supplying Petroleum Product], told about the problems of saving fuel during the operation of agricultural equipment:

"The Voronezh Administration supplies more than 4,000 customers and monitors the rational and effective use of fuel.

"I often meet with representatives of the Goskomnefteprodukty administrations of other oblasts and I can judge what our general problems are. First of all, order must be established in the warehousing activity. The kolkhozes have very many small storage facilities, and large petroleum-product storages have not been created. Frequently, tanks for storing petroleum product have not been fenced and are not sealed tight.

"Organization of the technical servicing work at storages and filling stations has been vested in USSR Goskomsel'khoztekhnika enterprises. This comes down, as a rule, to the selective painting of tanks, while questions of the preservation of petroleum product are left up to 'personnel.'

"In my view, USSR Goskomsel'khoztekhnika must develop, jointly with USSR Minsel'khoz [Ministry of Agriculture], a new form of agreement to set the responsibility of the parties concerned for taking steps to safeguard petroleum product.

"The inspectorate is checking on the practice of monitoring observance of consumption of petroleum product in the oblast's farms. The results, I can say frankly, are not encouraging. For example, fuel consumption norms for farms of the Roskolkhozmezhkhoz ydineniya system were brought to 114 grams per 1 ton-kilometer. When it was computed, actual consumption was 128. Meanwhile, a saving of 138 tons of gasoline was shown in the report that was sent to TsSU [Central Statistical Administration] organs. Where did they get it from? Local TsSU organs, not knowing the refined consumption norms, accept such reports as truth. And who prevents them from taking an interest in management of agriculture, in regard to an established norm?

* * *

The meeting's participants made recommendations that deserve the earnest attention of USSR ministries and agencies and republic organs.

Solving them most rapidly will enable the drive for savings of petroleum product to be strengthened.

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ENERGY CONSERVATION

AUTOMATION SAVES ENERGY AT UKRAINE'S FERROUS METALLURGY PLANTS

Moscow IZVESTIYA in Russian 24 May 82 p 1

[Article by S. Troyan (Zaporozh'ye): "Thrifty Automation"]

> [Text] Metallurgy is one of the most energy-intensive branches of the national economy. Much fuel and electricity must be expended to obtain a ton of pig iron, steel and rolled metal. But where much is consumed, there is also a potential for saving more. That is why the metallurgists have been assigned the task of saving 8 million tons of standard fuel equivalent during 1981-1985. Familiarity with the experience of introducing energy-saving measures at the industry's enterprises indicates that such a goal is completely attainable.

Until recently the metallurgists could not effectively keep an eye on the operation of power-engineering equipment. It often happened that at the plant's peak hours far more electricity was consumed than the schedules stipulated. As a result, they had to pay some hefty fines. The main harm was the fact that hundreds and thousands of kilowatt-hours were lost irrevocably.

Subunits of the young Ukrchermetavtomatika [Ukrainian Association for the Automation of Ferrous Metallurgical Enterprises] took upon themselves this and other problems that are in one way or another connected with the rational use of power-engineering and fuel resources. It has its departments and sections in those cities of the republic where the main metallurgical plants are located--in Zaporozh'ye and Dnepropetrovsk, Zhdanov and Donetsk, Yenakiyevo and Makeyevka.

Industry produces much of all kinds of equipment by means of which strict accounting for the consumption of fuel and energy can be arranged and supply schemes optimized. However, there has been no specialized service that will undertake to install complicated equipment, and not just install but also suggest how and where the greatest savings can be achieved. Now a serious gap has been eliminated. Important work is being done in accordance with economic agrements.

Here is an example. Industry produces automatic data-measuring systems for reporting and monitoring the consumption of electricity. The metallurgists knew about them. But knowing does not mean using. An equipment-production enterprise of Ukrchermetavtomatika undertook to install such a system. Here is what its director, A. Zhilin, says:

"In the Donbass [Donets Coal Basin] there was in essence no metallurgical plant that was immune to penalties for the overconsumption of electricity. As a rule, schedule violations cost each of them in the hundreds of thousands of rubles per year. But today the controller, with the aid of automated systems, actively influences electrical-equipment regimes and distributes the load in optimal fashion. This leads in the final analysis to energy savings. Such systems will begin to operate in the not so distant future at 60 metallurgical enterprises."

Everything is surprising in the roughing department of the celebrated Zaporozhstal'. Multiton steel ingots are fed, one after another, into high-capacity furnaces. Slowly the "lid" of the furnace disappears--and glowing-hot rectangles are submerged in it. Their temperatures are different.

"Without program-setting devices," says S. Azarin, Ukrchermetavtomatika specialist, "the schedule for heating an ingot in the furnace cannot be observed. Previously they did this by peephole. But now an instrument that is connected with a temperature sensor enables the regime for heating the metal in the furnace to be regulated automatically. The device was developed in collaboration with scientists of the Zaporozh'ye Industrial Institute. The time for heating the ingot was greatly reduced. Fuel consumption also was cut.

B. Yavor, chief of the section for monitoring and measuring instruments and for automation of hot-rolling departments, says with satisfaction:

"Our helpers from Ukrchermetavtomatika do their work excellently. We estimated that the four devices they installed on the furnaces saved 2,500 tons of standard fuel equivalent in 1981. It is planned to rig 30 furnaces with the instruments in 1982, and all 58 furnaces will operate on optimal regimes in 1983."

At that same Zaporozhstal', work is going on to replace mercury-arc rectifiers with semiconductor converters.

"Just two inexpensive instruments,'" says chief of the Central Electrical-Equipment Laboratory V. Klepchinov, "installed at our plant by Ukrchermetavtomatika workers enabled half a million kilowatt-hours of electricity to be saved per year."

Production workers, scientists and installers have replaced an obsolete feed system on the main vertical stand of the slabbing mill by a modern one, the basis for which is comprised of semiconductor circuits. The annual benefit is 300,000 rubles. In 1981, 3.5 million kilowatt-hours were saved.

P. Kolotilo, leading engineer of the starting and setting-up department, showed me a straightforward, fairly inexpensive instrument--an electronic temperature regulator. The required temperature can be maintained in the premises with its help. It operates in an automatic regime. The instrument will take upon itself completely the worry about, let's say, reducing the fuel feed at night and on Saturday and Sunday in the administration building.

"We consider," said V. Kabak, chief of the Energy Services Administration of UkSSR Minchermet [Ministry of Ferrous Metallurgy], "that the time has come to produce all kinds of apparatus and instruments for reporting the consumption of electricity and heat resources, not by bits but in their entirety. It is time to pinpoint the enterprises that will produce uncomplicated electronic systems for these purposes."

/The introduction of all possible kinds of instruments and systems that have been made by Ukrchermetavtomatika has enabled more than 25 million kilowatt-hours of electricity, about 60,000 tons of coke and 400,000 cubic meters of gas to be saved at metallurgical plants during the last five-year plan. Last year these figures also were meaningful. It is a matter of doing it soundly and comprehensively. [in boldface]/

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TECHNICAL ADVANCES AT COAL MINES

Moscow UGOL' in Russian No 5, May 82 pp 32-40

[Article by Ye. N. Rozhchenko, USSR deputy minister of coal industry: "On Some Questions of Technological Progress at Coal Mines"]

[Text] The direction of development of this country's economy in the 11th Five-Year Plan toward improving production efficiency was specified at the November (1981) CPSU Central Committee Plenum. This means that in this industry and at its enterprises, plans should focus primary attention on matters pertaining to renovation, retooling, increasing return on existing equipment and utilized systems (process), and raising the level of organization of labor at each work station.

Mine development plans specify improving mining operations and mechanization, which results in decreased labor input and a decrease in the size of the workforce, with a simultaneous increase in coal production which, in conditions of a shortage of labor resources, is one of the main tasks of technological advance in this industry not only in the current five-year plan but in the more distant future as well.

Recently coal production and mine worker labor productivity have declined somewhat. The reasons for this are the following: withdrawal of substantial capacity from production, inadequate volume of mine renovation, increasing depths of mining operations, worsening of mining-geologic conditions, decreased equipment productivity in more complex conditions, slow pace of equipment replacement with new, higher-output equipment, etc. Appraising possibilities and mine operation plans in the current five-year plan, taking into consideration the fact that a total output capacity of only 14 million tons will be constructed in new, high-productivity mines, and that in these next few years they will not exert decisive influence on this industry's technical-economic indicators, the necessity of taking immediate steps to achieve more aggressive improvement of existing mine facilities, which will make it possible to fulfill the 1981-1985 plan, becomes obvious. Therefore improvement in the efficiency of underground coal mining will depend first and foremost on initiative and an innovative approach to solving technical and organizational problems of improving the production processes by the people at the mines and associations, design and scientific research institutes, designers and industrial engineers at mining equipment manufacturers, and all those specialists

at all levels of management which draw up plans and projects for development and mechanization of mining operations and, together with workforces, organize fulfillment of these plans.

Renovation and Deepening of Existing Mines

Of the funds allocated in the 11th Five-Year Plan for mine construction, almost 88 percent of capital construction and 68 percent of construction-installation work is for renovation, retooling and maintaining the production capacity of existing mines. Completion and beginning of renovation of 36 mines is targeted. This is a small percentage of the total number of mines, but recommencement of production from all mines being renovated will result in the additional production of approximately 20 million tons of coal, while reducing the number of workers at these mines by approximately 22-25 thousand. The greatest expenditures are required for construction of new levels (mine deepening), exposing and developing faces adjacent to mine areas and new locations in adjacent areas to replace mined-out sections in the main mine area, acquisition of new and replacement of existing equipment, etc. Production associations, design institutes, construction organizations and corresponding administrations of the USSR Ministry of Coal Industry should more efficiently utilize these vast funds, primarily on developing facilities which provide coal production increase and reduction of workers employed in production at existing mines.

We know that technological advance begins with the preliminary scheme. Therefore, bearing in mind that mines, following renovation or deepening, as a rule do not achieve designed production, while many stopes regularly fail to meet the standard coal production level, it is necessary to revise all plans and remove possible "bottlenecks" and all disparities with the condition of continuous cutting face operations.

Particular attention should be directed to certain basic points of the plans, which in many cases are not adequately worked out, and as a result constructed facilities become bottlenecks in the process of operation and hold back coal production. Such points include the following: the existence of main-fan reserve capacity and more flexible controllability of the ventilation system; number of faces working simultaneously and substantiated maximum possible face work-loading; continuous operation of conveyer transfer, "bunkerization," automated control and other technical devices ensuring a high degree of reliability of transport operations; productivity of the machinery adopted in the plan, with an adequate reserve in each succeeding process, beginning at the working face; tunnel cross-sections which satisfy conditions of ventilation, placement of equipment and auxiliary transport, repair-free maintenance and safety of personnel; conformity between methods of calculating mine timbering and mechanized supports on the longwalls, and actual mining-geologic conditions; process and organization of driving from the standpoint of eliminating unproductive operations in the drift cycle and between cycles, and the procedure of advance preparation of working faces.

The principal plan review requirements also include a search for ways to shorten the time required to develop new levels.

This means that in planning mine renovation or deepening, one can more extensively utilize the possibility of partial movement into production of individual walls, seams, and blocks with intermediate startup units, without waiting for full completion of renovation. As an example of partial movement of a facility into production, we can cite construction of the Raspadskaya Mine on three timetables. But this is a new mine, and therefore block-by-block exposure and development of mine areas proved to be the simplest solution, and which was specified by the plan.

There also occurred in renovation of existing mines cases of bringing into operation a portion of lower levels prior to their full completion (the Mine imeni Lenin in Karaganda, the Yubileynaya and Zenkovskaya mines in the Kuzbass, etc), but these were forced decisions, which had not been specified in the initial plan and which were a result of delay in construction. In these cases plans were revised in the course of construction, frequently decisions were made which were far from the best, and construction cost increased as a rule. In order to avoid such situations it is suggested that "stepped" plans be drawn up, with advance-determined partial (intermediate) movement of facilities on-stream by year, with calculated technical solutions, construction volumes and timetables for individual facilities, ensuring effectiveness of intermediate movement on-stream of production capacity (just as movement on-stream of facilities without increase in capacity). It is imperatively required thereby that proper sequence of construction and full completion of the individual mine facilities specified by the "stepped" plan for each given year be rigorously observed in the plans and in their execution.

It is essential to evaluate construction plan fulfillment and the entire bonus system for construction organizations and for clients (managements) proceeding from fulfillment of plans pertaining to bringing specified facilities on-line, considering only timetable and quality of job execution. Job performance schedules and their quarterly execution can be the principal document for the Stroybank, with increased financial liability on the contractor and client and the personnel of these organizations (material incentive and bonus funds). The USSR Ministry of Coal Industry should be strict and highly demanding in this matter. Current-year completion-targeted facilities at mines not targeted for completion in the current year should involve mandatory execution by construction organizations, just as on current-year completion-targeted facilities in the national economic plan.

The above proposals are in conformity with the general principles of reorganization of management in construction on the basis of the end result -- commodity output.

Decrease in estimated construction cost.

At the present time in many cases the estimated cost of construction of new levels (70-100 million rubles and more) is unwarrantedly high, often essentially little different from the cost of construction of new mines with complex surface buildings, the service life of which on the one hand exceeds by three-five-fold the working life of the mine proper and leads to a chronic shortage of plan-specified capital investment for other high-priority facilities, and on the other hand presupposes failure to expend allocated funds, failure to

meet mine level construction timetables, and decrease in coal production in many mines, where the time required to deepen the mine runs into decades.

At the same time there are numerous examples of inexpensive construction, where highly simple solutions are adopted. The Pionerka Mine in the Kuzbass, for example, built the Kolmogorovskiy section, with a production capacity of more than 700,000 tons of coal per year, within a period of four years with its own manpower and resources, at a site 20 kilometers from the central facilities, on the basis of estimates for individual target seams. Outlay of funds on capital construction totaled 5 million rubles. The Kusheyakovskiy section at the Nagornaya Mine, with a production capacity of 1.5 million tons of coal per year, was built at a cost of approximately 12 million rubles.

We know that present requirements pertaining to environmental protection, health, housing and living conditions also lead to increased cost of construction. It is therefore particularly necessary to find ways to reduce the cost of basic and auxiliary production, by coming up with simpler technical solutions.

A substantial reduction in estimated cost can be achieved by excluding from estimates costs of driving along seams, adopting schemes with a higher degree of concentration of mining operations, with an increase in the number of cutting faces simultaneously in operation on a single slope, incline, and crosscut, employing blind shafts, large-diameter boreholes, concentration drifts, and other more efficient schemes for exposing and developing production areas. Another important task for the planners and designers is simplification and reduction in the size of buildings and structures, and making them of lightweight prefabricated components and local materials. Such experience has already been acquired in the Moscow coal basin during construction of the Berezovskaya and Nikulinskaya mines.

Of course other aspects are also possible in the mining level layout plans, connected with the specific features of the coal deposit, but the nine questions enumerated above and decisions adopted on these questions determine in the final analysis the possibility of achieving designed indices and technological advance.

Scientists should take active part in settling matters of designing mine layouts. Unfortunately, however, scientific research (technological) institutes and leading planning-design organizations bear no responsibility for execution of their recommendations and achievement of their predicted results. Scientific councils and specific institute specialists should be responsible for the scientific substantiation of the technology, principal parameters and indices of mining operations, productivity and reliability of machinery adopted in plans and designs. Apparently there should be a reorganization of wages for scientific personnel, so that the entire bonus portion of earnings is paid only for practical work results at specific mines. Perhaps it makes sense for each plan to have two chief engineer-designers and process engineers, for plans to be examined at joint meetings of two scientific councils, with only the final reconciled plans submitted to the ministry.

It is no less important that at the mines specialists thoroughly examine plan details and working drawings in order to determine prior to work execution the

reliability of all structures, their design, length of longwalls, conveyers, angles, engine power ratings, and cable system layouts.

This work is very laborious and requires a high level of qualifications on the part of executing personnel. At the present time specialists from the interested organizations do not examine working drawings. At best they are perused by third-grade personnel of the unified enterprise construction managements, who simply stamp them "Approved." With such a superficial attitude to project plans, frequently errors made in the plan create numerous difficulties in mine operation. Therefore the job of checking working drawings should be assigned to association services and the top specialists of mines, and technical documentation should not be permitted to be given to construction organizations without the written consent of specific responsible specialists. It is essential to work out a more detailed system of verification of technical solutions at the stage of working drawings and their execution.

Technical Retooling and Improving Production Efficiency

There are presently 520 underground mines operating in the USSR Ministry of Coal Industry system, producing approximately 430 million tons of coal annually. These mines contain 30,000 kilometers of workings, more than 7000 development and almost 3200 working faces, operating hundreds of thousands of units of mining equipment, which consume approximately 100 million kilowatt hours of electric power per day.

Miners are successfully adopting advanced mining techniques with modern, high-output machinery. The majority of primary production subdivisions -- sections -- fulfill and overfulfill state plan targets for coal production and excavation. Approximately 500 thousander-brigades, our famed millionaire brigades, and 600 high advance-rate brigades are models of organization and achieve high performance results with the same equipment.

At the same time 40-45 percent of production and development sections and brigades fail to meet plan targets for various reasons, frequently fail to meet the timetable for bringing working faces into production to replace exhausted faces, and are causing considerable shortfalls in coal delivery to the nation's economy. In 1981 coal production losses on operating working faces in all mines totaled 50 million tons due to various work stoppages, or 13 percent of total working-face production. Such losses cannot be justified by references to poor-quality equipment or unsatisfactory supply.

The main element in technical advance is the development of new equipment. Everybody remembers the outstanding achievements of this industry's miners in the 8th and 9th five-year plans, when the extensive employment of continuous miners on longwalls and conveyers in transporting coal made it possible to increase underground coal production by 47 million tons per year and at the same time to eliminate more than 120,000 exhausting underground manual jobs.

We have excellently designed and built mines, such as Vorgashorskaya and Raspadskaya, as well as the Estoniya coal shale mine, furnished with modern equipment. In every coal basin dozens of mines have exceeded their original design output capacities by double, triple or more and have greatly increased

Table 1

Sequence of Procedures	Persons Responsible	Execution Timetable	Form of Execution
1. Production process organization schedules			
1.1. Network schedules for preparation of mining excavation sections	Technical department chief	One month before work begins	The section preparation plan and network schedule are respectively submitted to the chief of the development section
Executing personnel	Development section chief	Daily	Maintaining execution schedule, correction of shift work schedules
1.2. Installation and takedown operations schedules	Installation subunit chief jointly with production section chief	One month before work begins	Schedule, distribution and organization of worker labor
Executing personnel	Installation subdivision chief	Daily	Maintaining execution schedule, correction of shift work schedules
1.3. Scientific organization of labor plans for cutting and development faces	Technical department chief, section chiefs, norm setting departments	Five days before beginning of month	Schedule of exposures, distribution among work stations, time and sequence of operations
Executing personnel	Mining foremen, section chiefs, expediters	Every shift	Monitoring during shift, mining foreman status report, work tasks by shift work orders, reports
1.4. Transport operations schedule	VShT [not further identified] chief	Continuously, with daily revision	Delivery time for empty cars, materials, hauling away loaded cars, etc
Executing personnel	Expediters and VShT mining foremen	Every shift	Maintaining execution schedule
1.5. Overall mine schedule of organization of production processes	Senior engineer for production organization, under the supervision of the deputy general manager for production	Continuously, with monthly revision	
Executing personnel	Expediters	Continuously	Maintaing execution schedule. Shift work orders
2. Work order system			
2.1. Execution timetables	Shift superintents, section superintendents	Every shift	By order, work regimen specified for the mine

Table 1 (continued from preceding page)

Sequence of Procedures	Persons Responsible	Execution Timetable	Form of Execution
2.2. Coordination of operations, elimination of violations of safety regulations	VTB [not further identified] chief, shift superintendent	Same	Work order books, work order authorizations
2.3. Completeness of information, clarity, concreteness, detailed description of shift assignments	Mining foremen, section supervisory personnel, shift superintendent	Same	Work order books, work order authorizations
2.4. Reports on accomplishment of shift, day's target, work stoppages and deviations from schedules	Mining foremen and brigade leaders	Every shift	Verbally to section superintendent, shift reports
	Section superintendents and chiefs of service	Daily	Current-operations meeting with mine deputy general manager
	Section superintendents and chiefs of service	Weekly	Analysis of equipment breakdowns and work stoppages with mine general manager
3. Expediter oversight			
3.1. Execution of all schedules and work orders	Expediters, shift superintendents	Continuously	Maintaining execution of schedules and logs. Taking effective measures to eliminate work stoppages
3.2. Verification of execution of tasks pertaining to safety engineering, operation of VChP, AGZ [not further identified]	Expediters, VTB mining foremen	Same	Recording instrument readings and mining foremen reports in the appropriate logs. Taking effective measures to correct violations. Halting work operations
3.3. Recording work stoppages and their causes	Expediters, mining foremen of production sections, duty electricians	Same	Obtaining information either from instrument readings or personnel reports in the sections. Recording in special logs. Taking effective measures to eliminate work stoppages
4. Execution of shift work orders at work stations			

Table 1 (continued from preceding page)

Sequence of Procedures	Persons Responsible	Execution Timetable	Form of Execution
4.1. Promptness of vehicle traffic carrying miners	VShT superintendent and foremen, deputy general manager for administrative matters	Every shift	Execution of schedule
4.2. Work shift at work station	Production section foremen and brigade leaders	Same	Execution of work regimen. Take over from preceding shift. Distribution of workers, check time and quality of performance of operations. Reject poor-quality work if applicable. Expediter information on any work stoppages. Turn over to following shift equipment, working face, excavation without halting work, etc
4.3. Accomplishment of safety and production tasks in conformity with current documents, instructions and regulations	Brigade leaders and foremen	Same	
4.4. Keeping work station, equipment, and excavation area in proper order	Workers, brigade leaders, foremen	Continuously	Assignment of work station, working section, equipment or individual assembly to specific individual, observance by that person of rules of operation, inspection, and maintenance. Verification. Noted in shift report. Report

labor productivity due to implementation of organizational-technical measures, adoption and utilization of new equipment at the requisite level. Unfortunately, however, very few mines are renovated and deepened to new levels in a timely manner, after that producing at the designed output level. We have well executed, high-productivity engineering layouts, but few working faces operating according to these schemes and achieving the performance figures specified by these arrangements.

We possess excellent continuous miners for cutting and driving, but machinery time amounts to only 30 and 26 percent respectively.

The targets for the 11th Five-Year Plan in this industry specify comprehensive programs for development and organization of manufacture of new machinery with a high unit power rating, high-output and reliable equipment. These include new-series continuous miners, from RKU-10 to RKUP-25, heavy 4PP-2 and GPK-2 continuous tunneling machines, high-output type UKP (Figure 1) [not reproduced], KMT, and KM-103 (Figure 2) [not reproduced] continuous miners, scraper-loader conveyer systems with a service life which is double to quadruple that of present equipment, plus many others. There is confidence that within the 11th Five-Year Plan we shall succeed in substantially increasing the percentage share of new-generation machinery in mining operations. But at the same time in the five-year plan calculations growth in labor productivity of a worker employed in underground coal mining due to utilization of new equipment is targeted to amount to only 4 percent during the five years while real growth in labor input on the basis of objective geological factors alone is estimated at approximately 7.5 percent.

Thus an increase in the efficiency of mine operations can be achieved only by utilizing all factors for potential growth in labor intensity and machinery useful operating time, decrease in the equipment breakdown rate and all types of work stoppages on working and development faces and the brigades working on them. Herein lies the principal factor of technological advance in the current five-year plan.

It is important today to obtain high overall labor productivity, not individual records. The achievements of the "thousanders" and "millionaires" should become the standard for all brigades on working faces, and the achievements of the "high-speeders" should become the standard for drift crews, and to achieve this it is necessary first of all to display initiative and an innovative approach to solving the numerous problems of mine operations. Let us take as an example two mines in the Karaganda Basin -- the Kazakhstanskaya Mine and the Mine imeni Kostenko. Their output capacity is approximately 3 million tons of coal annually.

At the comparatively new Kazakhstanskaya Mine, with total belt conveyer movement of coal, the plan failed to specify bunkering at the point of transfer from one conveyer to another. With high-intensity coal flows and an elaborate network of conveyer lines, this has proven to be one of the main reasons for a large number of work stoppages and low work loadings (to 600 tons per day) on the working faces. Labor productivity at this mine is 65 t/month.

For a long time no renovation was performed at the Mine imeni Kostenko. Thanks to the initiative of mine officials, however, simple, local-design bunkering locations were set up at all junction points of loaded conveyer lines. Average daily coal production from a longwall at this mine was 1492 tons in 1981, with labor productivity of 110 t/month.

The above example contains only one of the components of production efficiency -- the state of mining operations and coal conveyance. In actual fact many other factors are operating simultaneously. Mines are deepened, and this inevitably causes an increased labor input and decreased labor productivity. On the other hand, we frequently consciously increase the labor intensiveness of certain operations, specifying in the plans, for example, an increase in the percentage share of waste rock excavation or drift cross sectional size, with the aim a substantial future gain in labor outlays, when less manpower will be needed for maintenance and controlling fires from internal causes. But how can one oppose the inevitable increase in labor intensiveness? What must be done to ensure that the volume of coal produced in the current five-year plan can be increased taking into consideration the actual status and possible development of mechanization and concentration of mining operations?

Savings in labor outlays must be sought first and foremost in replacing men with machines and automatic devices to the extent to which will be permitted in the immediate future by the availability of equipment the design and manufacture of which are specified by the plan. But this is only part of the answer. The main task continues to be that of reducing unproductive time expenditures by the enormous machinery inventory presently in place and operating. An awareness of this by our management personnel, conviction that it is necessary to take immediate steps, and focusing of workforces toward combating work stoppages are the main condition for achieving the targets of the 11th Five-Year Plan. Therefore the principal efforts of industrial engineers, maintenance engineers, brigade and section supervisors, all engineers and technicians, as well as all mine and association workers must be directed toward eliminating the causes of work time losses. It is necessary to find additional reserves, especially for ensuring uninterrupted operation of totally mechanized working faces which, with a high actual level of work stoppages, today generate 69 percent of all working face production. A workforce should obtain an estimate of adverse affect to a mine's production activities from work stoppages and their effect on coal production figures and on wages of various worker categories for each day worked, in order for each individual to know the degree of his own responsibility and that of his fellow workers for escaped opportunities.

It is necessary to change some people's attitude that work time is a secondary matter, and to achieve this it is essential continuously to study the nature of work stoppages on the basis of numerous, regular time-and-motion observations and to organize precise computations of all types of work stoppages, immediately taking effective measures to eliminate their causes and applying indoctrination, instruction or punishment to the guilty parties. On the other hand, operations without work stoppages should definitely get moral and material incentive encouragement.

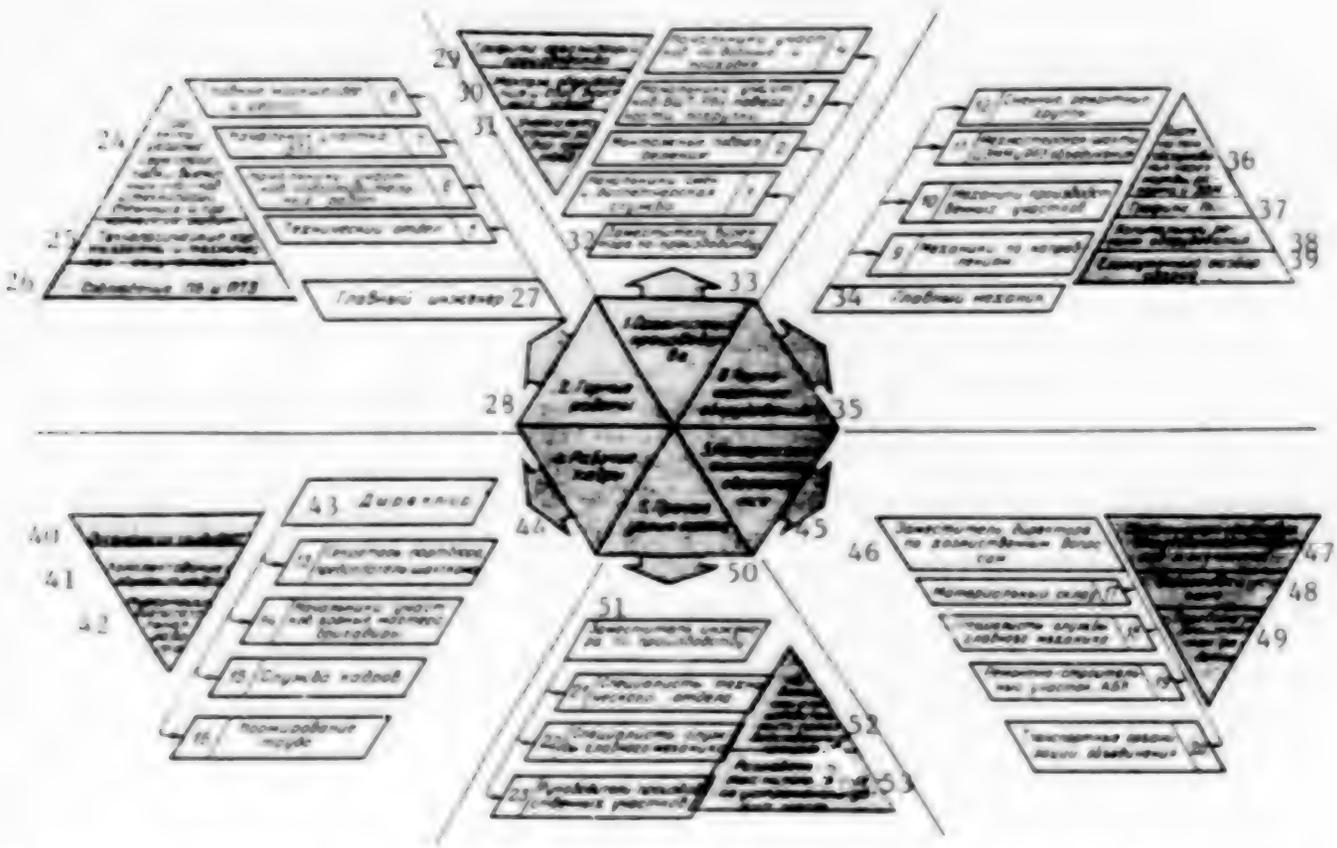

Figure 3. Uniform System of Combating Work Stoppages on Working and Development Faces

Key:

1. Shift superintendents and controller-expediter service
2. Installation subdivisions
3. VShT, RVU [not further identified], surface, and loading section superintendents
4. Production and driving section superintendents
5. Technical department
6. Development section superintendents
7. VTB section superintendent
8. Chief surveyor and geologist
9. Area maintenance engineers
10. Production section maintenance engineers
11. Mine machine shop, association central electromechanical shops and mining equipment repair plant
12. Shift maintenance teams
13. Party bureau secretary, mine committee secretary
14. Section superintendents, mining foremen, brigade leaders
15. Personnel service
16. Work-quota norm setting
17. Supply warehouse
18. Chief maintenance engineer service specialists
19. Maintenance-construction section, ABK [not further identified]
20. Association transportation organizations
21. Technical department specialists
22. Chief maintenance engineer service specialists
23. Production section supervisors
24. Planning development-excavation arrangements and process of production and driving operations
25. Process collation maps and technical documentation

Key to Figure 3 (cont'd)

26. Observance of safety and technical operation rules
27. Chief engineer
28. Mining operations
29. Production organization schedules
30. Installing equipment and bringing working faces into production
31. Record keeping and daily analysis of work stoppages
32. Deputy general manager for production
33. Organization of production
34. Chief maintenance engineer
35. Mining equipment
36. System of servicing and maintenance through work orders, reports and computer
37. Preventive maintenance schedules
38. Major overhaul of equipment
39. Daily analysis of equipment breakdowns
40. Organization of labor (scientific organization of labor)
41. Personnel acquisition and training
42. Information, indoctrination work
43. General manager
44. Personnel
45. Support
46. Deputy general manager for administrative matters
47. Timely delivery of equipment, materials and spares
48. Preparations for winter
49. Transportation of workers to work stations
50. Other bottlenecks
51. Deputy engineer for production
52. Reliability and productivity of production processes
53. Elaboration of organizational-technical measures to eliminate bottlenecks

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It is essential to devise a "Uniform System to Combat Work Stoppages." Very soon TsNIEIugol' [Central Scientific Research Institute of Economics of the Coal Industry] will formulate a standard scheme and basic provisions. It will be concretized at the mines, proceeding from existing conditions and taking into account bottlenecks which determine the nature of work stoppages. The uniform system is presented in a general form in Figure 3.

Table 1 contains an approximate sequence of actions by officials within the framework of the uniform system, within the section "Organization of Production." In the remaining sections, just as in the first one, the procedure and sequence of action should be determined in relation to the adopted management structure, operating conditions, and principal bottlenecks at the mine.

It is expedient to examine work time losses in each production process in three, traditionally established areas: production process work stoppages; work stoppages connected with excavated area and machinery problems; work stoppages for organizational reasons. It is essential thereby to consider the complexity of the mechanism of occurrence of work stoppages, that is, multiple occurrence and diversity of the specific causes of these work stoppages (objective disruptions of the material segment of production and subjective worker behavior). In order successfully to examine all the causes of work stoppages and to devise effective practical measures to correct them, a comprehensive program is required, in which there should be substantial participation by scientific and production personnel.

Production process work stoppages are caused by the necessary interaction among various operations which are incompatible in time of execution and involve the shutdown of the principal machines which determine a given production process. In advanced production process arrangements on fully mechanized working faces, process-determined interruptions in continuous-miner operations are not substantial, comprising 15-25 percent of the production work shift time. But much time is expended thereby on terminal operations and on preventive procedures of injecting water into the seam. On development faces the continuous miner "legitimately" does not work significantly greater time (up to 55 percent) due to the duration of timbering operations, and loaders on waste-rock tunneling faces -- due to considerable time expenditures on drilling holes and blasting. Actual process downtime is 50 to 100 percent greater than specified by operation schemes, which is a consequence of deficiencies in organization of production and labor and a high rate of breakdown of machinery and mechanisms.

In practice process layout designs at specific mines are frequently determined by traditional methods or under the pretext of a lack of needed equipment. On the overwhelming majority of development faces, for example, materials and equipment are delivered either manually or, where possible, by reversing belt conveyers, or by primitive ground-type "boats," which requires greater labor expenditures. Nevertheless as a rule new mines are being driven in the old manner. Some mines are employing series-manufactured cableways. The majority of drift crews, however, are performing the laborious delivery of materials and equipment by using drift crew personnel, that is, are diverting principal workers to secondary work tasks. A total of 175,000 man-days per month were expended on such tasks in 1981 -- each day 10,000 drift crew workers were not working on the face. At the same time experience in employing overhead systems manufactured by Scharf at the Mine imeni Yaroslavskiy indicates that labor requirements on supply and equipment delivery activities are reduced by 25-30 percent. A total of 300 overhead systems of Soviet manufacture (type DMK) are in operation at mines in this country, a very small number. With an annual production figure of 120 systems, it will take us 25 years to equip even half of all tunneling faces.

Or take another example. In conditions of complex, structurally disturbed deposits, where coal is mined from working faces by drilling and blasting, with an extremely low level of labor productivity and greater hazard, process work stoppages exceed 60 percent. Design institutes, however, when designing new mines and mine levels, and production associations, when expanding mining operations, are disinclined to propose a higher-output hydraulic mining process, where requisite work stoppages are reduced to 2-3 hours per day, and labor productivity is half again as great as at mines with conventional technology.

Scientific research (engineering), planning-design institutes and coal mining machinery plants must accomplish a great deal, within the framework of a comprehensive program, to achieve further improvement of machinery and production processes, bearing in mind mechanization of certain jobs which today are still performed manually, automation of certain machinery operations and, on this base, their more extensive combining and development of a system of higher-output basic and auxiliary equipment which fully achieves total mechanization of specific production processes.

There are many work stoppages for organizational reasons, and they are all different. Annual production losses are figured at 30-35 million tons of coal. We believe, however, that these figures are far from complete, since numerous interruptions occur in working face operations, interruptions connected with brief stoppages in the operation of conveyance equipment, wrong work sequence at the work station, delay in moving support materials, slowness on the part of certain workers in performing their duties, causing the crew to stand idle, as well as other causes, stoppages which are not figured in. The problem is that at many mines the people are accustomed to stoppages of this kind and are taking no steps to correct them.

In recent years substantial engineering methods have been adopted in this industry for controlling mining operations (collation maps for working pillars by mechanized equipment systems), mining machinery (servicing and maintenance of principal mine equipment on the basis of work order reports), and workers (scientific organization of labor plans). At many mines they have learned to employ electronic computers for controlling production processes. All this has had a positive influence on labor productivity growth. Hourly output per worker employed in coal production was 289 kg in 1970, and 370 kg in 1980. Manpower resource requirements have been reduced by 23,000 persons.

Matters pertaining to organization of production and labor discipline in conditions of increasing quantities of equipment per worker in the mines and high work loadings on the cutting faces are acquiring increasing importance. Production losses are growing substantially, even with the same magnitudes of work stoppages being corrected. And yet at many mines the above-mentioned engineering control methods, including scientific organization of labor, are not being employed. According to reports, scientific organization of labor plans are being utilized on approximately 22 percent of working faces, on 10 percent of development faces, and this is being done in a conditional manner to a great extent, since performance schedules for specific operations, on a longwall, for example, are coordinated in an extremely approximate manner with the operations of other production processes due to a lack of a unified production organization schedule for the mine as a whole.

A weekly or daily work schedule adopted at a mine, as well as a work order system cannot take the place of an overall mine production organization schedule. And yet such a schedule is essential if we intend to organize on a serious, scientific basis the activities of such a highly complex operation as a mine. An overall mine organization schedule of production processes should include working face development network schedules taking into account the critical path occurring at each given moment, installation and takedown schedules, work schedules for working and development faces according to their collation maps and scientific organization of labor plans, maintenance operations, transport operations, etc, with full intercoordination of all mine subdivisions, regulation of volumes and timetables of work execution, and availability of rigorously specified time reserves. Such a schedule can become the foundation for organizing smooth mine operations and to teach process discipline. Then the requirement to perform a specific volume of work on a specified timetable acquires the force of law, and the work regimen, work order system and controller-expediter service will become an effective tool for

subordinating the in-shift activities of each workforce and each individual worker to the rhythm of the schedule and to attainment of mine operation end results.

Unfortunately mining science has virtually lost sight of matters pertaining to organization of production in the mine. Therefore investigation of the causes of work stoppages and conduct of workers in conditions of underground mining in a complex interrelationship of the man-mineral resources-machine-process-labor result system is a vital obligation of our scientific research institutes. Scientific centers must be established in the coal basins, with the participation not only of experts in coal mining equipment and technology but also experts in the laws of ergonomics -- psychologists, sociologists, and doctors, so that by working together they can devise practical measures to organize production taking into account optimal utilization of the capabilities of men and equipment at specific mines with an established workforce and traditions.

Work stoppages involving mining operation and machinery breakdowns lead to extraordinarily large coal production losses (approximately 40-47 million tons), do enormous moral and material damage both to mine workers and to the state, and also constitute a major factor impeding technological advance.

We can list the following emergency-type work stoppages which produce the greatest losses.

1. Fires, gas and dust explosions, and their consequences. Just two fires at the Komsomolets Mine in the Kuzbass and the Mine imeni Gorbachev in Karaganda resulted in an annual loss of more than 1 million tons of coal.

2. Collapse of mine workings. The Chertinskaya Mine in the Kuzbass and the Saranskaya Mine at Karaganda lost more than 800,000 tons of coal in a year due to forced stoppage of production on working faces due to the need to repair access tunnels.

3. Operation of working faces in a zone of geologic structural weaknesses. Even on working faces operating in zones with structural weaknesses known in advance, the production plan target falls short by 4-5 million tons of coal per year. Sometimes for a period of several months the top brigades on fully mechanized faces decrease coal production by one half to two thirds. We should emphasize here that an emergency shutdown of a working face and a sharp decrease in face advance in conditions of moving a mechanized system across a structural weakness are in large measure a consequence of inadequate study of specific structural weakness areas, of the fact that the behavior of the rock cannot be predicted, and the total absence of any intelligently devised process techniques. In these cases each section superintendent makes his own decisions and devises his own techniques to pass the weakness while keeping his equipment in operating condition, in which he is not always successful. It would be simpler not to work these sections of seams, but this would increase coal losses in the ground, it would be necessary to have available a larger number of equipment systems for replacement, and the level of utilization of costly equipment would be reduced. One way would be to find a means of transforming structural-weakness rock and seams into a monolith, after which it would be cut through with the existing equipment system, or any other

Table 2.

Work Stoppages According to Controller-Expediter Figures	Number of Working Faces	Production Losses, t/day	Percentage Share of Losses	Explanation of Work Stoppages (Indicating Production Loss and Principal Causes)
Longwall production stopped in fire-affected sections	4	3800	10.7	2200 tons -- organizational reasons, fire due to violations of safety regulations 1600 tons -- process and organizational reasons. Spontaneous combustion in coal pile at face, which could have been avoided if prompt measures had been taken
Longwall operations in structurally weak zones	23	12,000	33.7	4000 tons -- process reasons. Continuous miners forced to work in environment with elevated gas generation, structurally-disturbed ground and roof 2800 tons -- organizational reasons. Late maintenance on mine workings, inadequate cross section, inadequate strength of supports. As a result -- forced stoppage on working faces during repairs on access roads 5200 tons -- organizational reasons. Low level of qualifications and organization of workers and supervisors, inadequate effectiveness of shaped-charge shooting or roof shoring, employment of systems inappropriate to existing conditions
Longwalls not placed in planned operating schedule	14	7000	19.7	1400 tons -- technical reasons. Termination of longwall operation -- putting supports under timber decking 1700 tons -- organizational reasons. Poor quality of installation and related difficulties of removing equipment from installation space 3900 tons -- organizational reasons. Lag in development of longwalls to replace terminations. Scheduled longwalls

Table 2 (continued from preceding page)

Work Stoppages According to Controller-Expediter Figures	Number of Working Faces	Production Losses, t/day	Percentage Share of Losses	Explanation of Work Stoppages (Indicating Production Loss and Principal Causes)
				not operating while waiting ior completion of installation (in this instance there were four of them, but in some months there are two to three times as many)
Machinery breakdown	15	11,100	31.1	6100 tons -- breakdowns. Stoppages caused by failures of individual machine assemblies due to poor-quality manufacture or design of said assemblies, lack of spare parts
				5000 tons -- breakdown causes which can be categorized as organizational, since this category included all breakdowns which occurred because of unsatisfactory servicing and maintenance and gross violation of equipment operationg procedures
Production operations halted by State Mining Engineering Inspection	3	1700	4.8	1700 tons -- organizational reasons, safety violations

methods of mining structurally-weak faces. At the present time chemical means of roof strengthening are being employed on approximately 120 faces. But they are of a limited nature. At the same time chemical compounds exist which not only "glue together" rocks but also create a thrust effect with a substantial increase in friction bonds (UGOL', No 2, 1982, pp 16-18), which enables us to consider the possibility and effectiveness of preliminary treatment of structurally weak sections of pillars. It would make sense to develop this trend on a larger scale and to establish a uniform system of organization of scientific research and manufacture of the requisite technical means.

4. Breakdown of machinery and equipment. According to figures for 1981, production losses due to equipment breakdowns exceeded 20 million tons of coal. A large part of these losses is a result of numerous breakdowns of scraper and belt conveyers, continuous-miner hydraulic systems, pumps, and various electric motors.

The above-listed work stoppage groups comprise approximately 80-85 percent of all eliminatable coal production losses on working phases fully provided with the requisite equipment. This does not include production losses occurring in connection with the fact that production sections are short of manpower, that some workers are insufficiently skilled, and that many workers are undisciplined and violate safety rules. An analysis of records and observations conducted in certain coal basins irrefutably show that the majority of work stoppages occur through the fault of workers and supervisors in the mine.

Table 2 contains a description of production face work stoppages in mines of the Karagandaugol' Production Association which were observed over a fairly extended period of time in the summer of 1981.

Of 130 working faces, 59 were generating a shortfall of 35,600 tons of coal per day. The plan was being overfulfilled by 10-16 thousand tons on 71 faces. More than 63 percent of losses were due to halting production on the faces as a result of incorrect actions by a large number of workers -- violations of technical procedures specified by the plans and documentation, as well as safety regulations, due to the vaguely formulated obligations of each worker pertaining to volume and nature of work performed, timetable and quality of execution, a poor level of discipline on the part of certain individuals, slack demandingness on the part of supervisors, especially mining foremen, absence of an atmosphere of demandingness, and at the same time a benevolent attitude toward personnel.

There are many methods of developing in a workforce interest in one's work and creation of an atmosphere of search and responsibility for the condition of each work station and the end performance result of the entire workforce. A system of automatic recording of work stoppages is highly useful in this regard. In order to provide mines with self-contained equipment operating independently of the calculating machines which are being installed at a limited number of the largest mines, there is a possibility of setting up the manufacture in 1982-1985 of approximately 400-450 TSD-1M remote indicating units, with data on all machinery shutdowns transmitted to the controller-expediter's station. Thus in 1985 we can have up to 300 mines in which error-free and complete

recording of work stoppages will be conducted. It is important that this capability also be continuously utilized for analyzing the reasons for work stoppages, to correct them effectively, as well as to educate and increase the sense of responsibility of supervisors and workers.

A most important means of increasing the activeness of workers and one of the principal component parts of technological advance is study and adoption of advanced know-how and, on this basis, development of socialist competition for the highest labor productivity. But this work will not tolerate formalism or sporadic activity for the sake of show.

Constant and continuous organizational work is needed, on eliminating bottlenecks and on teaching and indoctrination of workers, brigade leaders, and mining foremen. We cannot accept the fact that for several years now the number of thousander brigades has not been increasing but has even been declining at certain times, although every year up to 300 schools of advanced know-how are operating in this industry. We have many mines where all brigades are successfully achieving tough plan targets, handling work loads which are double to triple the average standards for the industry. At the Nagornaya Mine of the Gidrougol' Production Association, for example, there are only three production brigades, but they are all producing 500-600 thousand tons a year each. At the Mine imeni Kostenko at Karaganda there are seven brigades which have taken for themselves the target of producing 500,000 tons per year each, with two-shift production. But at the same time there are many mines at which only one brigade is working at a high level, while the remainder are not participating in this movement.

Advanced know-how is a perfected technological procedure and is therefore mandatory for application in similar mining conditions. We send to advanced know-how schools mine employees who are production organizers and highly-skilled workers precisely so that they can apply at their mines those work methods which produce the greatest results. Associations should establish plans of utilized know-how of leading brigades for specific mining faces with excellent plan indices and mandatory utilization.

There is no more important task today than to achieve more mass involvement in the movement of thousanders, high-speed drift crews, and high-speed installation crews. And this can be done only on the basis of advanced know-how, reducing work stoppages and increasing work intensity. Production and scientific organizations as well as officials at all levels of management must execute an abrupt turn toward resolving urgent problems of achieving savings in work time and labor outlays.

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COAL MINE DESIGNS SUBJECT TO TOO MANY REVIEWS

Kiev PRAVDA UKRAINY in Russian 13 May 82 p 1

[Article by S. Akhmatov: "What Has Been Incorporated in the Design"]

> [Text] The collective of the Underground Mine imeni 26th CPSU Congress was the first in Pavlograd Coal Production Association to carry out the 1981 program ahead of time, sending to the surface 1.2 million tons of coal. Yet the seams at the mine, which was put into operation in 1965, are not of high capacity but are less than a meter thick. Designers from Dneprogidroshakhta [Dnepr State Institute for the Design of Underground Mines] are maintaining creative ties with the operators, helping with their recommendations to realize the progressive trends that are incorporated in the design. And here are the results: the enterprise's design capacity has been greatly surpassed.

It had been proposed that Underground Mines Nos 27/35-5 be laid down side-by-side with an advanced underground mine. But if its reserves are added to those of the existing mine? The need for the new one disappears. USSR Minugleprom [Ministry of Coal Industry] had authorized only a portion of the reserves of the undeveloped mine to be added on. Dneprogiproshakhta specialists defended their point of view, considering that the partial "add-on" does not solve the problem for the long term. And, consequently, it is "good." Modernization of the existing mine will enable the new block to be introduced into action and work to continue on the achieved level for another 25 years without shutting down the old mine.

The institute's role is not restricted to the design of underground mines. Its collective constantly follows up on their development and makes timely recommendations to introduce the most recent achievements of technical progress.

The criterion of a fuel's effectiveness is not the "naked" ton but its heating value. The lower the content of useless rock in the coal, the fewer the railroad cars needed to haul it and the more appreciably will discharges that pollute the atmosphere be reduced and the service life of boiler-units increased.
It would seem that the miners should be concerned about fuel quality. The institute considers that this also is its responsibility. The design of Nagol'chanskaya Underground Mines Nos 1 and 2 (Donbass [Donets Coal Basin]) introduced a hopper with spiral chute that was developed by the institute, and in this case the anthracite is ground up much finer. The benefit is 500,000 rubles per year.

Mine geology is especially complicated at West Donbass coal fields. The institute has developed basically new engineering solutions that are applicable to it. Three-dimensional layout and constructional solutions for permanent buildings and structures have been improved. Ordinarily, when building a new underground mine, temporary buildings and structures are erected, which are later disassembled. The design for the new Underground Mines Nos 18/19 barred temporary buildings--permanent buildings are constructed right away. And they differ considerably from the former ones. For example, lightweight metal structure of reduced dimensions is going into the building for lifting machines, and the footings for the machines are prefabricated reinforced-concrete modules. Boldness of engineering thought? Yes. But it is precisely this that is required for accelerating the construction of underground mines. The use of these and other innovations will speed up the construction of Underground Mines Nos 18/19, of 1.2 million tons capacity, almost 1½-fold in comparison with the existing pace.

"The builders' erection of permanent fixed mine facilities for their own needs, instead of temporary facilities," says institute director G. S. Pin'kovskiy, "reduces labor intensiveness by 18,000-20,000 man-days and the consumption of metal by 300 tons and of cement by 1,100 tons."

The integrated quality-control system that Dneprogiproshakhta used in the design provides for the obligatory use in the designs of the recommendations of scientific research institutes and of production workers and of approved inventions. Measures for saving building materials and energy resources are carried out in a mandatory procedure. Deadlines are established, and those responsible for developing engineering innovations are appointed. All this is recorded in the personal creative plans of the designers, including the institute's supervisory workers. The statute about raising officials' categories and salaries as a direct function of the final work results is helping to raise the creative activity of these individuals. A special classification commission is in operation. Its recommendations are confirmed by secret ballot at a meeting of the scientific and technical council.

"Today," says G. S. Pin'kovskiy, "there are underground mines whose erection is being drawn out, the budget estimate of their cost rises, and the design indicators are being mastered slowly. Why does this occur?"

"There are several causes," answers Gleb Stanislavovich. "The design institutes have not been the masters of their own designs, and sometimes they incorporate in them decisions that cannot be carried out at the given time. The design institute has to coordinate its development with 10-15 scientific-research and other organizations, and the design is subjected to several expert reviews. Moreover, there is the fact that this leads to a loss of the institute's responsibility for the decision it originally adopted, years are spent on coordinations and expert reviews, and the design becomes obsolete and has to be updated. Expert reviews and coordinations are, of course, needed, but there should be far fewer of them."

These thoughts should be listened to.

11409
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TRACTION-UNIT REPAIR LACK STYMIES EKIBASTUZ, KUZBASS STRIP COAL MINES

Moscow SOTIALISTICHESKAYA INDUSTRIYA in Russian 13 May 82 p 2

[Article by O. Buzuluk (Moscow): "Promises Instead of Assistance"]

> [Text] Since the start of the year Kemerovougol' [Kemerovo Coal Production Association] and Ekibastuzugol' [Ekibastuz Coal Production Association] transport workers have not been able to remove about 4 million cubic meters of overburden because of inactive OPE1 traction units. Therefore, reserves of several million tons of fuel have not been prepared for mining.

A lack of spare parts has led to idle time for high-powered OPE1 traction units at Kuzbass [Kuznetsk Coal Basin] strip mines. Plans for removing overburden and fuel are being disrupted. In order to correct the situation somehow, mechanical engineers and repair workers are dismantling inactive machines for components and parts. There is no place to repair the machines. Kuzbass [Kuznetsk Coal Basin] equipment operators I. Kovalenko and A. Chukatkin raised these questions in their letter (SOTSIALISTICHESKAYA INDUSTRIYA, 15 April 1981).

M. Bogomyakov, chief of the Bogatyr' Loading and Transporting Administration wrote about this to the editor from Ekibastuz. For the high-powered equipment here has no work without the needed components and parts. At Ekibastuzugol' 59 traction units remove fuel. But the condition of the machines is so poor that 16 of them are constantly in repair, and they are compelled to replace them with old diesel locomotives. Even the Bogatyr' Strip Mine, the world's highest in capacity, was singled out for this fate.

The newspaper made inquiries to the appropriate ministries and agencies. More than a year has passed since then. There has been enough time to decide how to help the miners. But the partners--the USSR Ministries of Electrical Equipment Industry, Railroads, and Power and Electrification, the Novocherkassk Electric-Locomotive-building Plant, and Soyuzglavtyazhmash [Main Administration for the Supply and Marketing of Heavy Machinebuilding Products] and Soyuzglavelektro [Main Administration for the Supply and Marketing of Electrical-Equipment Products] under USSR Gossnab--are not hurrying.

As a result, of the 180 traction units on USSR Minugleprom's books, 29 have been written off. The same fate awaits the next 32, for they, as the documents state, are not eligible for rehabilitation. And another 60 machines are in an inoperable

condition. This means that every third one is laid up. They are awaiting spare parts or their turn for repair. Are they waiting in vain?

The question did not arise by chance. In March of last year the VPO Soyuzelektroremont [All-Union Production Association for the Repair of Electrical Equipment] of Minelektrotekhprom [Ministry of Electrical Equipment Industry] organized a section at Ekibastuzugol' for the repair and testing of electric traction motors. But in May only one worker remained there, and the repair matters were curtailed successfully.

Mintyazhmash [Ministry of Heavy Machine Building] and the Kolomna Diesel Locomotivebuilding Plant took an understanding attitude toward the miners' needs. They did not look for justifying excuses, but considered the possibilities and greatly increased diesel spare-parts shipments--3-fold. Moreover, they sent specialists to Kemerovo and Ekibastuz to speed up repairs and to transfer units for maintenance servicing. But that would not prevent the creation of special sections there.

The Ministry of Heavy and Transport Machine Building is also examining other questions in the interests of the coal miners. VPO Soyuzdizel'mash [All-Union Diesel-Enginebuilding Association] chief P. Gerasimenko reported, for example, that agreements to organize the production of castings, made from high-strength cast iron, at enterprises of USSR Minugleprom itself are in prospect, so Mintyazhmash [Ministry of Heavy and Transport Machine Building] can machine the castings and send them in the form of spare parts to the strip coal mines. Soyuzdizel'mash agreed to help to organize diesel-repair bases at Kemerovougol' and other associations that operate diesels.

But this ministry, unfortunately, answers only for the diesel part of the traction units. The other--the electrical equipment part--has been left in the dark. The manufacturers of the machines from the Novocherkassk Electric Locomotivebuilding Plant did not answer the protests of the Kuzbass equipment operators, did not attribute due importance to the Minelektrotekhprom workers' letter, and played a waiting game with USSR Minenergo [Ministry of Power and Electrification].

Perhaps they simply had nothing to say? But indeed the miners had put the question concretely to Director V. Duvarov, Director of the Novocherkassk Electric-Locomotivebuilding Plant: why does the enterprise persistently abstain from producing units of three sections, as agreed to under the terms of the support agreement, and deliver only two-section units? The train's productivity is reduced at once by one-third. Because of this alone the coal miners could not remove 90 million cubic meters of overburden during the 10th Five-Year Plan. For that same reason, last year the Kuzbass and Ekibastuz transport workers did not remove more than 10 million cubic meters of rock, which prevented the development of more than 4 million tons of coal reserves to be undertaken.

The Novocherkassk workers persistently ward off the third-section matter, although as far back as 4 May of last year RSFSR State Arbitrarion V. Zaytsev confirmed that the plant should deliver to Kemerovougol' only three-section locomotives. The answer was--the delivery of machines made up of two sections. The customers were not mollified--they applied sanctions. But the southerners preferred to pay up to 76,000 rubles' fine for each machine, and they did not make any three-section models.

It is still worse for the repair of parts: the plant filled orders for only one-fourth of the funds, pleading a severe shortage of machine-tool operating specialists, a lack of available space and other difficulties. According to the specifications, the service life of the OPE1 is 25 years. But how will a unit serve out this period if the manufacturers do not even send the subcontractors the industrial tooling and the necessary attachments and stands that have been agreed upon.

Deputy USSR Gossnab Chairman G. Myl'nikov reported to the editorial board only a small increase in the amount of spare parts (and there are several tens of items that are in short supply).

The railroaders could do much to help the coal miners. But the Deputy Minister of Railways V. Sosnin has refused point-blank: "The repair of rolling stock of the OPE1 type, which does not run on the railroads' mainlines, is not specified for MPS [Ministry of Railways] shops; this has been charged to the industrial ministries. By way of extending assistance, we can send, at the coal associations' requests, technical documentation for making various types of equipment at USSR Minugleprom enterprises." That is, comrades, convert to complete self-servicing!

Well, and what about the coal miners? Their repair base is weak. In the Kuzbass they rehabilitate only some components of traction units at the Kemerovougol' Machinery-Repair Plant at Mezhdurechensk. Repair capacity has been created at the locomotive and car barns of the Chernigov Strip Mine, but USSR Minugleprom organizations are working extremely slowly here. The miners' chief hopes are placed in a plant for repairing rolling stock and for producing spare parts in the Kuzbass town of Belovo. But its first phase, if all goes well, will go into operation only in 1984. And reconstruction of the Ekibastuz plant for repairing mine-transport equipment will be completed at the very end of the five-year plan. But how many units will remain in operation by that time?

There is, however, a way out. If there are spare parts, then these high-capacity machines will operate. This means the components and parts are needed urgently, right now. The promise to allocate them in adequate amounts after the Novocherkassk and Dnepropetrovsk Electric-Locomotivebuilding Plants have been rebuilt is not convenient for the coal miners. If for no other reason than the fact that no one will name definite dates, and the problematic "abundance" of spare parts will emerge after the 11th Five-Year Plan. And the variant proposed by chief of VPO Soyuzelektrotransmash [All-Union Association for the Production of Electrical Transport Vehicles] Yu. Romanov--to send, instead of two units, spare parts worth the same amount--does not suit the mines. Some help--to send unassembled that which should be assembled! But, as USSR Minugleprom told us, they even force the mines to take the unassembled parts.

In seeking a way out of the situation, the electrical-equipmentmakers proposed to replace the traction units with other transport--so-called motorized dump cars. Here is the opinion of Deputy First Minister of Electrical-Equipment Industry G. Voronovskiy: "Later an increase in the output of motorized dump cars can be organized through a reduction in the output of the traction units." Possibly this is more advantageous for Minelektrotekhprom. But the coal miners, given the prevailing shortage of traction equipment, need full delivery of the locomotives. Yet, while the annual Kuzbass and Ekibastuz requirement is 65 units, less than half of them arrive. And often, as we know, they do not last the guaranteed service life but go out of order and stand idle.

A first warning note was sounded in 1980, when there remained at the strip mines 8 million tons of overburden and fuel that had not been removed. At the end of this five-year plan Kuzbass and Ekibastuz transport workers are to haul 1½-fold more than at the end of the 10th Five-Year Plan. How is all this to be removed?

The Kuzbass and Ekibastuz are the country's two large stokeholes--they will grow and become stronger. In order to remove rock and fuel, many more locomotives and other high-capacity switching machinery and a sound base for repairing them are required. You will not help matters here with mere formal replies.

11409
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COAL MINING EXPANDING ON SAKHALIN ISLAND

Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 82 p 13

[Article by A. Malyy (Sakhalin Island): "Sakhalin's Coal"]

[Text] One of the underground coal mines, the Dolinskaya, is on the Okhotsk shore, 60 kilometers from South Sakhalin. My companion, Director for Economics of the Sakhalinugol' [Sakhalin Coal Production Association], acquainted me with its production history. Gennadiy Aleksandrovich Skorlov is an authority on Sakhalin and its riches, having lived here more than 30 years. He has given 10 of them to the coal industry--the oldest industry on the island. Coal mining, which was observed by the courageous Russian officer N. Boshnyak in 1852, was started earlier here than in other Far Eastern basins.

"Coal's share in Sakhalinskaya Oblast's fuel balance is about 73 percent," says Gennadiy Aleksandrovich. "Sakhalin coal is sent to Kamchatka and to Magadan, about a million tons of it annually."

So That Mining May Increase

Sakhalin's coal industry is at present represented by 13 operating underground mines and the Lermontov and Novikov strip mines. The deposits are convenient to work. A large proportion of the seams lie at shallow depths. The Sakhalin fields do have some vexing peculiarities: very complicated fields from the tectonic standpoint, they are broken up into small islets, the width of the seam never being identical--changing frequently. A second peculiarity: there are many sharply dipping seams in Sakhalin's underground mines, for the cutting of which, unfortunately, the designers still have not created special machinery.

Nevertheless, much work has been done at the industry's enterprises in recent years to introduce mechanization and automating equipment, and the miners' work has been greatly eased. The mechanization of drifting operations has reached 96 percent, and the length of the mine workings with metal supports has sharply increased. Nowadays half of the coal taken from the slightly dipping seams is mined by integrated mechanization. The brigades under P. Obukhov and P. Korolev have mined an estimated more than 1,000 tons of coal per longwall per day.

The Dolinskaya Underground Mine is the largest in the association. Right now 950,000 tons of coal are mined here, and in 1984, when its reconstruction will be

completed, capacity will grow to 1.2 million tons. Unfortunately, rebuilding has been stretched out. The biggest bottleneck remains the coal-preparation plant.

The Udarnovskaya Underground Mine also is being rebuilt slowly. Housing construction leaves much to be desired, although Glavsakhalinstroy [Main Administration for Construction on Sakhalin Island] of USSR Minvostokstroy [Ministry for Construction in the Far East and Transbaykal Regions] has at its disposal on the island construction and installing capacity that will allow 90 million rubles' worth of work to be done per year.

The Sakhalinugol' Association is developing its own construction base. Already construction administrations and several sections have been created, for which 15 million rubles' worth of work has been planned for this year alone.

One of the important reserves for increasing coal-mining effectiveness is a reduction in coal losses.

According to the testimony of A. Ponomarev, inspector for underground conservation of the Sakhalinsk District Administration of Gosgortekhnadzor [State Committee for Supervision of Industry Safety and for Mining Inspection], much coal still is not being taken from the underground mines. Typically, it is mainly coal that has been readied for excavation that is lost.

Most of all the Gornozavodskaya Underground Mine collective is leaving coal. During the last 5 years losses were 150,000 tons. The amounts here as a whole exceed design losses, and the areas mined are not always worked to the limit. Things are going on the same way in mining of the coal reserves at the Tikhmenevskaya, Makarovskaya and Mgachi Underground Mines.

There are also examples in the association of a zealous attitude toward the riches of our land. Thus, the supervisors of the Uglegorskaya Underground Mine have improved the process for controlling the roof of the seam, have used hydraulic-blasting methods, and this year obtained more than 10,000 additional tons of coal. Unfortunately, the innovation has not found wide application in Sakhalin's underground mines.

The Miners' Preoccupation

It must be said that the association is doing much to inculcate in the people a sense of responsibility and of motivation. At the start of the year, measures were worked out in detail to provide for the stable operation of each coal-mining enterprise. The suppression of nonproductive expenditures and action against mismanagement were increased.

For example, the association once paid a penalty for above-norm idle time of railroad cars and containers. Based on the papers of an investigation of the causes, the general director issued an order. In partial reimbursement for the damage done, it was decided to call to account the deputy chief of the Ol'khovka UMTA [Administration for Supplying Materials and Equipment] and the chief of the Kolpashchikov Transportation Sector, through whose fault the idle railroad car time was allowed.

However, cost accounting serves as the chief means for motivating each worker toward the interests of the enterprise and to teach the workers to count the state's

kopecks. Specialists and supervisors, after studying the structure of the prime production costs, have undertaken special monitoring of materials consumption, for this takes up more than 20 percent of the prime production-cost structure. Because the use of longwall miners has started, an opportunity to save timber has appeared. Today, consumption per 1,000 tons mined has been reduced from 46 cubic meters to 17.5 cubic meters. In brief, no small amount--several thousands of rubles of savings--are being obtained each month.

Inculcation of managerial traits is being helped by such factors as the pecuniary sanctions that are now being applied, let's say, for the late turnover of empties, personal accounts of savings, up-to-date reporting and monitoring of the managers' production-economics activity. All these measures have also stimulated an expectable breaking point with the past. However, people need a knowledge of economics, in order to strengthen it. Therefore, the mines are striving to organize economic training that is directly connected with the specific tasks that the collective is performing.

At an association party meeting, the communists spoke about performance discipline and a feeling of responsibility by the supervisors of underground mines. The discussion was open, sharp and based upon principal. Almost every speaker emphasized the need for a change in workstyle and for strict and exacting monitoring of the execution of orders and local instructions.

"We have drowned in the stream of orders and instructions that we have issued, and at times we have not reinforced them with the necessary organizational work," said Deputy Director for Capital Construction V. Borovik in his speech. "Remember a year ago, an order was issued about preserving and storing materials and equipment? And how has it been carried out? Of the 66 measures planned, only about 8 have been implemented...."

Prospecting-type exploration in Uglegorskiy Rayon recently disclosed the promising Solntsevskoye field of low-ash coal, with reserves suitable for strip mining.

The construction here of a strip mine with a capacity of 6-10 million tons of coal per year will radically change Sakhalinskaya Oblast's economy, enable prime production costs to be reduced, and the shortage of solid fuel that is now being felt to be covered.

For this purpose, aside from boosting exploration of the new field that USSR Mingeo [Ministry of Geology] is carrying out, such questions as transporting coal to the customers require solution.

Solution of the questions that are problems right now for the association will enable productivity of the underground and strip mines to be raised greatly, stability of operation during any weather to be provided for, and the coal-mining industry on Sakhalin Island to be converted into a reliable fuel base for a substantial part of the Far East.

11409
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FUELS

KOMSOMOLETS DONBASSA MINE OPERATIONS

Moscow UGOL' in Russian No 5, May 82 p 22

[Article by Engineer V. D. Baranovskiy, general manager of the Komsomolets Donbassa Mine: "On Operations of the Komsomolets Donbassa Mine"]

[Text] The giant Komsomolets Donbassa Mine was constructed in record time, unparalleled in the history of the coal industry. In December 1980, one year ahead of schedule, unit I was delivered, which brought congratulations to the construction workers and operating personnel from CPSU Central Committee General Secretary Comrade L. I. Brezhnev, chairman of the Presidium of the USSR Supreme Soviet.

The commercial reserves of this section of the coalfield total 224 million tons. The coal will be used for power industry needs. The coal seams are being accessed on a two-level arrangement, by means of two centrally located vertical shafts and main crosscuts coinciding with the placement of levels: haulage-road and drainage-ventilation. A ventilation shaft and a return-air shaft, 0.6 m in diameter, have been provided for ventilation.

The mine area is divided up into four blocks, extending up to 10,000 meters along the strike and up to 2100 meters along the dip. Coal is hauled in VD-3.3 bottom-dumping mine cars. Personnel are carried on VP-18 mine cars along the horizontal seam roads, and by remote-controlled 6DMK monorails along inclined roads.

The main shaft, 7 meters in diameter, is equipped with skip windings for hoisting out coal and waste rock, with multiple-cable winding units on a headframe. The coal skips have a capacity of 31.5 m^3 and the waste rock skips -- 13.6 m^3. Ventilation is provided by VTsD-47U fans, which were first built for this mine. The mine is classified as highest category for methane, the seams present no dust danger, and seam L_3 presents a hazard of coal and gas outbursts without warning. In order to reduce the quantity of methane in the outgoing air stream, degassing is applied to the seam, associated rocks and mined-out space along all seams being worked. The bord-and-pillar system is being used in this mining operation, with longwalls advancing to the rise.

The Komsomolets Donbassa Mine is an enterprise with a high degree of mechanization and automation of production processes. Equipment working the faces

includes high-output KM-88 and KM-87UME systems, and the LKMS-97 unit with an SO-75 scraper-loader.

At the present time five longwalls are working seams L_4 and L_7, with a work loading of 450 tons per day, while seam L_3 is in the process of readying for production. The best section is Number 2, where Hero of Socialist Labor N. A. Sokolov is brigade leader. The brigade has achieved a loading figure of 1000 tons of coal in a 24-hour period.

4PP-2 continuous miners are extensively employed in development working. Tests have been conducted on the 4PP-5 experimental continuous miner, designed for horizontal working on a cross-sectional area of 10-36 m^2 in the rough on coal and on rock to a hardness of f=6. The unit's output is 150-250 m/month.

The brigades led by N. V. Osinskiy and S. G. Lemishevskiy are the top performers based on work results for 1981.

Many coal production cutting and development working processes are automated. All conveyer lines, ventilation and pumping installations have been automated, and they are controlled from a central panel. Automated production control and recordkeeping is at the adoption stage. An M-6000 computer will be continuously ready to provide information on longwall production. The coal will be stored on the surface, and waste rock will be filled back into excavated space with the aid of a DZK [not further identified].

The average age of the employees at this mine does not exceed 27 years, and therefore the main task for the mine management, party, trade union and Komsomol organizations is to instill in the young workers a feeling of professional pride and responsibility for the assigned task.

Production leaders have transferred to this mine in order to give practical assistance in mastering the new equipment and process, as well as to share their vast life and work experience: from the Stozhkovskaya Mine -- Hero of Socialist Labor N. A. Sokolov, P. R. Vashkevich, holder of the Order of Lenin and the Red Banner of Labor S. G. Lemishevskiy, plus others, who have become fine mentors for the young miners. The miners are faced with the responsible task of bringing the mine up to designed output.

The mine management, together with specialists from the appropriate services, have drawn up and are implementing a number of organizational-technical measures to improve operations on production and development phases. Organizational-technical measures have also been drawn up for ensuring economical consumption of electric power and heat.

Reviews and competitions are being held in order to improve production efficiency and work quality, to ensure economy and thrift at the mine; they foster growth of active miner innovation in seeking and finding additional reserve potential for achieving savings and efficient utilization of electric power, metal, fuel, and other materials.

Consistent implementation of an economy regimen and skilled utilization of material resources, in combination with other measures to achieve thrift and economy, are producing results. The VPD-47U fan (on the main platform), for example, operated at 500 rpm powered by an SDSZ-17-76-12U4 electric motor, 4000 kilowatts, 6 kv, with an almost fully enclosed unit, with guide vanes ($Q=225\ m^3/s$, $h=10^3$ Pa). Fan operation under these conditions was leading to a substantial overconsumption of electric power and was unsatisfactorily reflected on the operation of the bearing assemblies and the fan as a whole. An efficient mode of operation of a VTsD-4U fan with a 500 kv, 240 rpm AKS-16-44-24 electric motor, made it possible to save 14,080,354 kilowatt hours of electricity, amounting to a savings of 142,100 rubles. This efficient operating mode was suggested by power and machinery service specialists V. I. Burbel and A. B. Berdnikov.

A suggestion by heat engineer S. I. Denisenko on improving scraper-excavator design in the operation of scraper winches for removing slag from the boiler facilities made it possible to achieve savings of 11,600 rubles, including 360 tons of fuel valued at 8200 rubles. Conversion of the boiler house over to casinghead gas will make it possible to save 20,000 tons of coal annually.

Efficient utilization of materials, fuel, electricity, and decreased employment of manual labor have become the daily business of mine management personnel, economists, and engineers. They endeavor to organize work operations in such a manner that each individual gives thought to improving production processes and supports each and every valuable initiative.

Acceleration of the pace of scientific and technological advance is closely linked with development of active worker innovativeness. VOIR [All-Union Society of Inventors and Efficiency Innovators] activities have been stepped up at the enterprise. In 1981 workers, engineers, and technicians submitted 160 efficiency innovation proposals, 144 of which have been adopted, generating savings of 168,000 rubles.

The miners are working with great enthusiasm in the new year. They will do everything necessary to ensure stable mine operations and will make every effort to meet their pledges.

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3024
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BRIEFS

ORDZHONIKIDZE COAL MINE SUCCESS--Yenakiyevo--Mines of the Yenakiyevskaya Underground Mine are leaders in the Ordzhonikidze Coal Production Association competition. Since the start of the year they have sent the national economy 14,500 tons of fuel above the plan. This success was achieved thanks to high production sophistication and precise work organization. There are no lagging sections or brigades at the mine. In the lead are the collectives under O. Orlov, N. Maleyev and Ye. Bagdanov. The miners recently reexamined their commitments. They adopted a decision to mine at least 20,000 tons of fuel above the plan before the end of the year. [By G. Dorofeyev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 27 Apr 82 p 1] 11409

VORKUTA COAL MINES' SUCCESSES--Vorkuta--Miners of the Ayach-Yaga Underground Mine of the Vorkuta Coal Production Association are 4 days ahead of the schedule. All the enterprise's mining sections are doing shockwork and are yielding much fuel above the plan. Altogether since the start of the year the advanced collective has more than 20,000 tons of coal above the plan to its credit. [By V. Krukovskiy] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 8 May 82 p 1] 11409

KARAGANDA COAL MINE SUCCESSFUL--The miners of one of the oldest underground mines in the Karaganda Coal Production Association--the Underground Mine imeni Gorbachev--has confirmed the accuracy of the calculations incorporated in the year's commitments. Working ahead of the schedule, the collective had on 22 May mined its millionth ton of fuel since the start of the year. Every 10th ton was produced above the plan. Having raised the pace of mining, the collective began to send out daily to electric-power stations a thousand tons of fuel above the plan and was at the head of the competition in the basin in honor of the USSR's 60th year. [Text] [Moscow KRASNAYA ZVEZDA in Russian 23 May 82 p 1] 11409

VORKUTA COAL-MINE SECTION--Vorkuta--Miners of Mine Section No 3 of the Vorgashorskaya Underground Mine under Mine Engineer O. Bobrov came to the polling stations today in fine humor. They had coped successfully in carrying out their pre-election socialist commitments: each day they had mined 3,000 tons of coal and recorded in their above-plan account 80,000 tons of fuel. [Text] [Moscow PRAVDA in Russian 20 Jun 82 p 2] 11409

DONETSKAYA OBLAST COAL MINES--Donetsk--Donetskaya Oblast mines have carried out their annual commitments. Since the start of the year they have sent customers 1,225,000 tons of fuel above the plan. Eleven of the 12 coal-producing associations coped with the plan and overfulfilled the prescribed task. In taking up the

labor drive in honor of the 60th anniversary of the forming of the USSR, Krasnoarmeysk Coal Production Association collectives worked with precision and coordination--since the start of the year they have mined 292,000 tons of fuel, the Shakhtersk Anthracite Production Association 187,000 tons, the Sovetsk Coal Production Association 123,000 tons and the Makeyevka Coal Production Association 126,000 tons. Many coal enterprises do not have lagging brigades or production sections. [By G. Dorofeyev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Jun 82 p 1] 11409

'BAYDAYEVSKAYA' MINE OF NOVOKUZNETSK--Novokuznetsk--Miners of the Baydayevskaya Underground Mine of Novokuznetsk have produced their 50-millionth ton of coal since the enterprise began operating. At the start of operations the miners were producing 60-100 tons of coal per day, but today the Baydayevskaya collective has to its above-plan account alone more than 100,000 tons of fuel since the start of the year. [By V. Burmakin] [Text] Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Jun 82 p 1] 11409

NOVOKUZNETSK COAL MINERS--Novokuznetsk--Miners of Ordzhonikidzskiy Rayon of the city of Novokuznets resolved to carry out the plan for the first half of the year by the day of the elections for the local soviets of people's deputies. They coped with the production program for the first 5 months of the year 10 days ahead of the deadline. More than 7 million tons of fuel--540,000 tons of it in addition to the task--have been sent from the mine faces of the 8 coal-mining enterprises of the rayon to the surface since the start of the year. The miners' collectives of the city's leading rayon are participating actively for a worthy greeting to the 60th anniversary of the forming of the USSR. The brigades led by candidate for oblast soviet deputy Viktor Bovt and candidates for city soviet deputies Hero of Socialist Labor Yegor Drozdetskiy and Vladimir Bardyshev are imparting a battle spirit to the labor rivalry. [By A. Tenditnyy] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Jun 82 p 1] 11409

NOVOKUZNETSK'S 'NAGORNAYA' COAL MINE--Novokuznetsk--For more than 13 years now there have been no lagging collectives at the Nagornaya Underground Mine, and it has worked rhythmically and highly productively. This year was not an exception: 35,000 tons of coal have been recorded in its above-plan account since the start of the year, and monthly labor productivity per worker has exceeded 105 tons. A high indicator! But it is still higher in the brigades of Hero of Socialist Labor Ye. Drozdetskiy and delegate to the 26th CPSU Congress R. Stakheyev. Daily, advanced collectives are sending 2,000-2,500 tons of fuel to the surface, and they are working without accidents or idle time. Both brigades resolved to produce daily at least 250-300 tons of coal daily above the task. [By N. Poluyanov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 May 82 p 1] 11409

NEW KAZAKH COAL FIELD--The reserves of the Borlinskoye coal field, which has been explored in the steppes between Karaganda and Tselinograd, have been confirmed with an evaluation of "excellent." Almost half a billion tons of fuel that can be mined by the effective strip-mining method lie here. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 22, May 82 p 3] 11409

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CONSUMPTION OF MATERIAL RESOURCES FOR PIPELINE CONSTRUCTION REEXAMINED

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 6, Jun 92 pp 34-37

[Article by M. Kaganskiy, special correspondent: "Construction of Main Pipelines: Outlays and Results. Efficient Use of Material Resources"]

[Text] A round table meeting took place last year in Tyumen' which was organized by the editorial staffs of the journals MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE, PLANOVOYE KHOZYAYSTOV, KHOZYAYSTVO I PRAVO, and SOTSIALISTICHESKIY TRUD. Its participants were workers of economic, party, soviet, trade union and komsomol agencies. They discussed questions of the efficient use of material resources for the construction of main oil and gas pipelines [No 6, 1981].

A year has passed. What has changed in this time? The editorial staff of the journals asked the participants of the round table meeting this question.

From the helicopter window the pipeline route looks like an even line. But the steel "dragon fly" descends lower and everything that seemed smooth and even from the height of a bird's flight, acquires real ground outlines and dimensions. Every now and then multiple-meter, at times rust-eaten pipes appear on the shoulders of the steel trunkline. As they say, these pipes have been lost. They are not gathered. The builders, having finished their route have gone far ahead, the tundra swamps have eaten up the temporary dirt road and now there is no return road.

The organizations of the USSR Ministry of Construction of Oil and Gas Industry Enterprises have abandoned about 20 km of pipe on the Urengoy-Chelyabinsk gas pipeline route. Many of them were left at the Urengoy-Gryazovets, Urengoy-Petrovsk gas pipelines and other routes, says the head of the section of the Tyumen' CPSU obkom B. S. Trofimov.

Pipe losses on the routes can be prevented, the head of the Tyumen' main territorial administration of the USSR Gossnab, V. V. Zaychenko believes. One of the possible ways is to include a representative of the main territorial administration in the staff of the inspection commission. The commission now includes many specialists. There are no supply workers on the commission.

"We should not sign a certificate," says V. V. Zaychenko, "until all the pipes have been removed."

As a result of careless and incorrect storage, many pipes are damaged, corroded and are not suitable for use on the main pipelines. The Tyumen' main territorial administration of the USSR Gossnab has realized over 13,000 T of large-diameter pipes in 1.5 years at the request of the Glavsibtruboprovodstroy. For some reason these pipes were unsuitable for use in the construction of main pipelines.

Neither the builders nor the transportation organizations are responsible for the preservation of the pipes. The railroad workers and the river workers unload the pipes where it is convenient for them. At times this means unequipped and floodable platforms. Representatives of the administrations for production-technological acquisition do not show the proper exactingness to the transportation workers for incorrect storage and damage to the pipes.

The main state arbitrator of the Tyumenskaya Oblast V. P. Zverev considers that it is necessary to create those economic conditions under which the builders would bear weighty material responsibility for pipes damaged because of them. In the final analysis it does not make any difference to the state why, say, the pipes cannot be used where it was planned, as a result of damage or for some other reasons. The result of poor management is the same, valuable items are removed from the turnover. If the builders pay for the pipe damage, they will become interested in a more prudent attitude towards these expensive items.

The workers of the Tyumen oblast committee of people's control and the main territorial administration, and Gosarbitrazh have intensified their influence on the builders. There have been fewer instances of amnesty for negligent managers and the measures taken have become harsher . Sanctions are taken more often for squandering resources. There has recently been an increase in the number of cases associated with major construction that the Gosarbitrazh of the Tyumenskaya Oblast has examined. The fine sanctions have more than doubled. They have exceeded R 5 million.

The results of the intensified control work are visible. The builders have started to focus more attention on improving the storage and use of pipes. Nevertheless a radical break has not yet taken place. The leaders of the construction central boards refer to objective reasons, lack of roads, poor quality projects, untimely shipments and much more. It goes without saying that all of this does occur. But the main reason is still the lack of responsibility and the lack of desire to organize the work as it should.

The facts are obvious that the builders receive a lot more pipes than they really need for laying the oil and gas pipelines. By-passing the established order they often sell valuable items to other organizations. Thus, the trust Yuganstruboprovodstroy in 1.5 years sold over 600 T of pipe without orders to outside organizations. The trust Samotlortruboprovodstroy squandered over 4,000 T of large-diameter pipes. In the Nizhnevartovsk garages were build from sheet metal and pipes for boats. The organization of workers' supply from the administrations of the Megionneft' trust made a barrier around a restaurant from new pipes.

Where do the surpluses come from? For pipes are items which are strictly funded and their number is computed based on the length of the pipelines. The main reason is miscalculations in the planning and shipments, and weak responsibility for materials. This is the opinion of the workers of the Tyumen' CPSU obkom. Their colleagues from the oblast committee of people's control agree with them.

"The total volume of pipe shipments is now determined by the ministries," says the deputy chairman of the committee Yu. I. Sanin. "But who precisely receives them, and which construction site they arrive at, is not known. The lack of an accurate address and the lack of responsibility for the shipments results in irresponsibility and wastefulness."

V. V. Zaychenko has the same opinion. The Glavtyumenneftegazstroy, Glavsibtruboprovodstroy receive pipes for the entire production program. It would be correct to allocate resources with a target purpose for large pipelines. There are a few of these unique objects in the Tyumenskaya Oblast. Their priority should be defined and the funds allocated separately. This will make it possible to regulate the shipments for the most important objects and intensify control over the use of the resources.

The supply-marketing organizations of the USSR Ministry of Construction of Oil and Gas Industry Enterprises continue to ship pipes without regard for the actual need of the start-up facilities for specific types, grades and sizes. At the same time, according to the data of the Glavsibtruboprovodstroy and the Glavtyumentruboprovodstroy, there were quite enough pipes arriving in 1981 to to supply this year's construction program. Nevertheless none of the construction organizations refused the allocated funds. The builders use "fresh" pipes, and those that arrived earlier are "not noticed." This results in a breaking up of the batches of pipes intended for started projects and future facilities.

The planning organizations of the customer ministries do not always present orders for the pipes by diameters and wall thicknesses 2 years before the beginning of construction as is expected. The pipe orders have to be made much earlier than the planned-estimated documents are received, the head of the Glavsibtruboprovodstroy N. I. Kurbatov explains, therefore pipes are gathered which are suitable for the given facility while the rest become above-standard.

The year 1982 was no exception. By the end of February, the Glavsibtruboprovodstroy and Glavtyumenneftegazstroy had not received planned-estimated documents for tens of millions of rubles, a significant part of the annual program.

Last year's round table meeting discussed the lack of agreement in the actions of the customers and contractors, designers and planners, and other participants of construction. However there have not been any serious changes in this work. Over 20 central boards of 10 different ministries are concentrated at the construction of facilities of the West Siberian oil and gas complex. All of this results in separateness of actions and inefficient outlays of materials and other resources.

Attempts are now being made to concentrate control over the work. For this purpose central boards are being set up in the regions, general contractors who will adopt the main "power." But many organizations of other departments are not subordinate to them and form a "state within a state."

In Novyy Urengoy, for example, the Glavurengoygazstroy has been set up, in Tyumen', Glavsibzhilstroy, in Surgut, Glatyumentruboprovodstroy. But the organizations of the USSR Ministry of Transportation Construction, RSFSR Ministry of the River Fleet and USSR Ministry of Power and Electrification are not included in this centralized plan. They try in every way to be isolated. The Ministry of Transportation Construction and Ministry of Power and Electrification organizations in Novyy Urengoy do not even want to have ties to Tyumen', therefore it is difficult to control them. Their central boards are located in Moscow. The responsible workers of other ministries which often come here have to solve problems of building roads and power transmission lines lines... with foremen.

The ministry subdivisions are unwilling to unify forces and resources. Each of them has its own passenger transportation, its own departmental communication, bakery and health station. The bureaucratism results in enormous waste of material and other resources. It is necessary to develop a distinct order for determining the percentage participation of the ministries in the financing of the common objects of the infrastructure for the entire territorial-production complex.

The activity of the subdivisions of all ministries and departments participating in the construction of facilities of the West Siberian oil and gas complex into a single technological line can be united so that it acts with the precision of an industrial conveyer. This is the most important task of the interdepartmental territorial commission on questions of the development of the West Siberian oil and gas complex. It was created recently, neverthless it has already succeeded in solving some important problems. At the same time it could not completely overcome the departmental separation of the construction participants and unify them.

Today, for example, a lot of resources are wasted inefficiently because there is not a good repair base. The mechanical arming of construction of facilities in the oil and gas complex has risen immeasurably and will rise further. There are over 100,000 automobiles, tractors and construction machines in operation at the enterprises and construction sites of the West Siberian oil and gas complex. They service 180,000 workers. Tens of thousands of people are involved in repairing equipment. Both machines and people are often idle because of the shortage of spare parts. But their shortage is often imaginary. Spare parts for more than R 66 million have been accumulated at numerous warehouses of different organizations, a quarter more than the standard.

The interdepartmental commission has introduced suggestions for the creation of a repair base to service the auto-tractor and road-construction equipment. It has been acknowledged that it is necessary to concentrate the attention

of the machine construction industries, the manufacturers of the equipment, on centralized repair of the assemblies and units. It has been recommended to the ministries that they build specialized plants, set up assembly shop repair in the regional centers of technical maintenance and guarantee centralized supply of spare parts through the USSR Gossnab. However these recommendations have not yet been taken into consideration.

The enterprises of some ministries do not object to transferring the production areas proportionally to the number of operated machines and mechanisms, for the creation of regional centers of servicing, spare parts warehouses and regional specialized centers of servicing. However, this progressive method of repair is being slowly developed.

One of the main tasks of the interdepartmental commission is to guarantee balance of plans of all the subdivisions of the ministries and departments which are participating in the creation and development of the West Siberian oil and gas complex whose main indicator is the extraction of oil and gas. This is not a simple task. Its solution is complicated by the fact that it has not been defined sufficiently clearly and accurately which enterprises and organizations must be included in the West Siberian oil and gas complex. Now the set of enterprises of the Tyumenskaya, Tomskaya, and Novosibirskaya Oblasts which are exploring for oil, gas and condensate, extracting, preparing and transporting them, as well as all the work accompanying this are considered to be the West Siberian oil and gas complex. But it does not include the transport organizations, enterprises of the construction industry, and power engineering industry. As a result, the complex is disrupted and not integrated. This impairs the optimal planning.

The following question has not been resolved yet: does the interdepartmental commission have the right to influence the activity of the sectors which are not included in the complex? The efficiency of work of the interdepartmental commission is also reduced because it cannot make rapid decisions. This is the opinion of the deputy chairman of this commission G. K. Alpatov. It is necessary to have clear regulation of its operational functions. In the statute approved by the USSR Gosplan regarding the commission this is not stated. As a result the work with the ministries is impaired. The interdepartmental commission does not have the authority to deal with them directly. It can do this only through the sections of the USSR Gosplan. It is paradoxical, but a fact that the territorial commission which is acting on the rights of the Gosplan section is subordinate to the section of the same Gosplan.

An acute problem in the development of the oil and gas complex is improvement in the material-technical supply. Provision of resources should be constructed on a basically new basis. The plans for construction need to contain a special section, planning the organization of material and technical supply which would reflect the geography of the shipments and the simple transport plan for incoming basic materials.

This question was raised at the round table meeting last year, but has not yet been resolved. At the same time, the concentration of resources in one hand, the main territorial administration, will promote elimination of many reasons

for poor management, effective consumption of material resources for the construction of main pipelines. They are now scattered. The USSR Ministry of Construction of Oil and Gas Industry Enterprises has five central boards in the region which provide the basic material resources directly. Now over 50 percent of the metal, 90 percent of the pipes, almost 60 percent of the hardware, including electrodes, are obtained by the builders through the ministry, by-passing the main territorial administration. It only knows the total quantity of materials supplied to the construction central boards. There is no detailed information about the specific types of resources. The multiple-channel sources for incoming material resources impair their effective use and complicate monitoring of the correct consumption and shipment schedules.

All of the metal should be transferred to the territorial administration, V. V. Zaychenko believes, even the pipes up to 500 mm in diameter which are used for repair-operational needs. It is expedient for the order for metal to be made by the Tyumen' main territorial administration. In the region there are trusts which require dozens of items of metal in "homeopathic" quantities, 20-30 T. The ministries send the transit standard, 2 cars. Naturally they yield fewer items of metal in return for larger batches. This type of supply is the direct path to superstandards.

The plans for material and technical supply must include the construction of warehouses, the allocation of capital investments for their construction. For some reason this is currently considered a secondary concern. As a result, the materials are often stored by the builders on open, unprepared platforms, are damaged, broken out of sets, and then stolen. Each ministry creates large reserves for itself. In practically any construction trust and administration there are semiprimitive warehouses. The warehouse operations here are generally done manually. Machines are used very rarely.

The solution is for the ministries to set up on percentage principles high-output warehouse complexes at the sites of concentrated construction and to transfer them to the main territorial administration. This will cost the state much less than constant creation of temporary warehouses. It will become possible to rapidly maneuver the resources. At the large warehouse complexes one could set up 6-month, 9-month or 12-month reserves, depending on the transport plan for delivering materials, and provide for the needs of major construction and the repair-operating needs.

The need for creating these warehouse complexes is understood by the builders themselves. The head of Glavsibtruboprovodstroy N. I. Kurbatov, for example, believes that the realization of the main materials, and first of all the metal, through the enterprises for shipments of the USSR Gossnab would permit elimination of numerous questions. The presence of bases which have a broad, complete assortment of materials at the territorial administration would free the construction organizations of the creation of "buffer" reserves which are often made to compensate for the lack of smoothness in the shipments. The extant plan for supply with numerous handlings of freight only delays the time for the shipment and often results in damage to the materials.

The USSR Ministry of Construction of Oil and Gas Industry Enterprises unfortunately wants money for the construction of warehouses and does not allocate the necessary capital investments. For example, today there are no bases which are suitable equipped for reception of pipes in Ser'gino, Urengoy, Tobol'sk.

Nizhnevartovsk and other places of concentrated construction. The base in Surgut is being built slowly. At the same time, the lower construction subdivisions understand very well that they cannot do without bases. In the oblast committee of people's control, they have related that some of them are building these bases "contraband," through resources designed for other purposes. This is better than nothing, of course, but the solution is temporary and results in inefficient use of forces and resources.

Many participants of the discussion noted that as of yet there have not been any economically and technically justified standards for the consumption of material resources as applied to the specific nature of the West Siberian oil and gas complex. It is therefore difficult to set up strict accounting, and this means, efficient use of resources.

The current standards have not been substantiated. They make it possible for the negligent managers to squander resources, and at the same time hide in these standards. There always is the possibility of writing off broken, damaged or stolen materials for primary production. According to the existing situation, for each kilometer of route it is planned to spend 1008 m of pipe.

"We are not exceeding the additional consumption of pipes that is suggested for kilometer of laid pipe," says the deputy head of the Glavsibtruboprovodstroy A. K. Bondarenko.

How is this so? Tens of kilometers of pipes remain in the tundra to rust, and the builders are already contriving to confine themselves, it would seem, into the strict standards and to hardly conserve. The solution is quite simple. For some reason the route was changed, most often straightened and shortened. This means that the consumption of pipes is reduced. But they are written off not for actual outlays, but according to the planning-estimated documents. The "scissors" between the planned and actual consumption also create possibilities for sham economy.

The builders have formed considerable surpluses of unaccounted for pipes. This is a channel for squandering valuable resources which must be covered. It is sufficient to establish accounting for and writing off of pipes for their actual expenditures. The head of the department of the oblast CPSU committee B. S. Trofimov and the head of the Tyume' main territorial administration V. V. Zaychenko express this opinion. There is also the decision of the interdepartmental territorial commission on this question. It suggests including in the accounts, the 2-sn indicator for the availability of pipes welded into a line and delivered to the customer. This will permit calculation of the real, and not planned consumption and will reveal the specific parties guilty of overconsumption.

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TECHNIQUE FOR DEFINING TYUMEN' PRODUCTION RESERVES EXPLAINED

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 6, Jun 82 pp 39-41

[Article by T. Bogopol'skaya, head of the department of the Tyumen' Engineering-Construction Institute, and P. Nidzel'skiy, deputy head of the Glavtyumenneftegazstroy: "Under Northern Conditions"]

[Text] The northern Tyumenskaya Oblast is characterized by severe natural-climate conditions, weak development of the transportation network. Therefore, in order to guarantee smooth operation of the enormous construction conveyer, it is important to set up continuous supply of the necessary materials, machines, mechanisms and spare parts for them to the construction organizations. It is impossible to solve this task without creating definite production reserves.

In this case it is necessary to take into consideration that too large of a reserve requires additional outlays associated with storage and losses governed by natural-climate conditions of the region. And conversely, the low volume of production reserves is fraught with an interruption in the supply of material resources for the construction sites and the plan for major construction. The problem of the formation of reserves of construction materials under West Siberian conditions develops from here, and consideration of the geographic and economic features in determining their quantity.

The seasonal nature of the influx of freight, the frequent change in the periods of operation of the transport lines, and the seasonal nature of the consumption of materials associated with the possibility of performing construction-installation operations only in a definite time of the year, most often only in winter have a significant effect on the organization of construction production in northern Tyumen'. All of this affects the formation of the production reserves.

In order to solve the problem, one should first of all develop a technique which would permit determination of a scientifically substantiated (minimum) quantity of reserves to guarantee continuous operation ofthe construction organization. At the same time the currently existing instructional, method and scientific literature does not answer the question of what should be the optimal reserves under northern conditions.

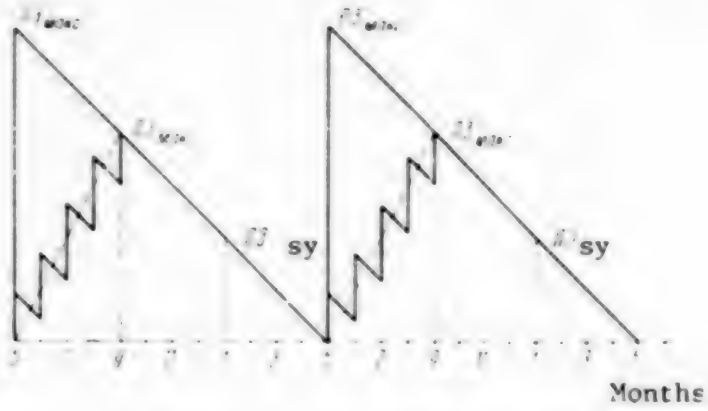

Figure 1. Nature of the Change in the Size of Production Reserves with Seasonal Influx and Uniform Consumption

Key:

$П.3'$, $П.3''_{макс}$. Maximum amount of production reserves with one-time and multiple shipments by days

$П.3_{sy}$. Amount of production reserve at start of year

Study of the features of construction of oil and gas pipelines in the northern Tyumenskaya Oblast led us to a conclusion that it is impossible to make a unified recommendation for the formation of production reserves suitable for any construction site. We therefore suggest several variants for setting up and using them. In this case we adopt as the norm that quantity of raw material and materials which the consumer and enterprises should have for shipments of products of the territorial agency of the USSR Gossnab in order to guarantee continuous production in the period before their influx after the seasonal interruption.

We define the maximum size of the seasonal reserve by the number of days in the greatest interruption in the influx of materials from actual data for the past several years. The norm for this reserve for the beginning of the planned period is computed by the number of days from 1 January to the latest date of the first shipment after the end of the seasonal interruption. In the transition to natural or monetary measurements, the size of the reserve in days should be multiplied by the volume of the daily average consumption in the appropriate measurement units.

The nature of the change in the size of the reserves with their seasonal influx by water and uniform consumption is presented in fig 1. The average annual production reserve in this case equals half of the maximum or the number of days between the last shipment in the previous navigational period and the first in the next. The size of reserve at the start of the year equals the number of days from 1 January to the first shipment of materials.

When materials arrive in summer (by water) and further by winter road, with uniform consumption, the production reserve significantly rises. The nature

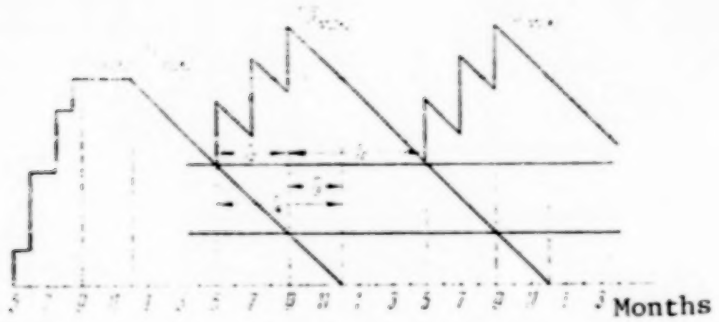

Figure 2. Change in the Size of the Production Reserve with Import of Materials by Water and Further to the Object by Winter Road and Uniform Consumption of Them

Key:

T_c. Time interval between last shipment in previous navigational period and first in the next, days.

T_2. Period of time between first and last shipments in navigational period, days

$T_4=T_2+T_3$. Period of time between first shipments by water and winter road

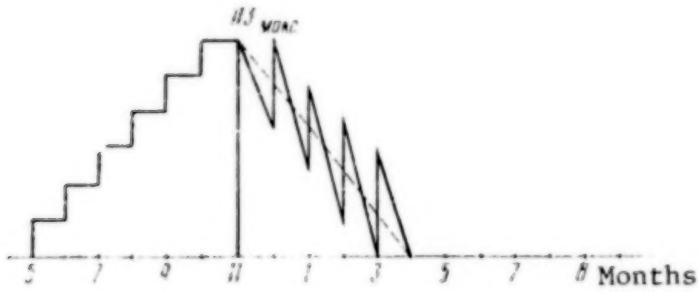

Figure 3. Change in the Size of Material Reserve with Regular Shipments and Seasonal Consumption (in winter)

of its change is presented in fig 2. In this case, the size of the production reserve increases by a quantity equal to the need of the enterprise for the period between the shipment by water and the start of operation of the winter road.

In order to determine the maximum reserve, it is necessary to subtract from 360 the number of days between the last shipment in the navigational period and the first on the winter road. The average annual reserve is defined as

the sum of the number of days between the first shipments by water and winter road and half of the period between the last shipment in the previous navigational period and the first in the next.

It is characteristic that under these conditions the size of the production reserve in the organization can never equal zero. Its minimum value equals the time interval betwen the start of the shipments by water and by winter road, while the maximum--more than the annual reserve for the period between the last shipment by water and the first by winter road.

As noted above, under conditions of the Tyumenskaya Oblast, the seasonal nature can be governed by the possibility of working only in a definite season, which is characteristic, for example, for the construction of pipelines on very swampy locality. The most effective from the viewpoint of minimizing the size of the reserves in this case is the approach of the time of importing the materials to the time of their consumption by compiling shipment schedules which are agreed upon by the suppliers and the consumers. The production reserve is defined from the generally accepted technique both with uniform shipments and consumption, that is, depending on the periodicity and smoothness of the shipments.

The average annual size of the production reserve depends on the volume and periodicity of consumption and is the product of half of the maximum reserve and the particular from dividing the number of days in the material consumption period by 360. The size of the reserve at the start of the year depends on the period of producing the work. If it is in summer, then on 1 January it equals 0, and if it is in winter, then the production reserve equals the interval of time from 1 January to the date of completion of the work.

With regular influx and seasonal consumption of the materials, the maximum reserve is formed before the start of work and is computed as the difference between the consumption and the period of consumption. The average annual value equals half of the maximum. Thus, the smaller the period of consumption, the greater the maximum size of the production reserve with other conditions equal (fig 3).

In the practice of organizing construction under conditions of the north, it is possible to have cases of combining the seasonal nature of the shipments and the seasonal nature of consumption. The change in the size of the production reserve in this case is shown in fig 4. The maximum value of the production reserve equals the annual need, if the periods of influx and consumption of materials do not coincide. Otherwise the size of the reserve is determined by the standard method depending on the periodicity and smoothness of the shipments. In order to determine the average annual reserve it is necessary to multiply half of the maximum by the sum of the periods of influx and consumption, add the product of the maximum reserve times the period of storage of materials between the end of the shipments and the beginning of consumption, and divide the sum by 360. The size of the demand for materials for the period from 1 January to the end of the work will be the production reserve for the beginning of the year.

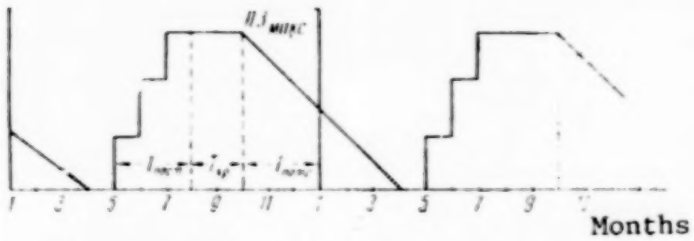

Figure 4. Change in the Size of Reserves with Seasonal Nature of Shipments and Consumption

In the cases where the materials are regularly shipped by railroad and further to the object by winter road, and are uniformly consumed, the production reserve is defined in the same way as with seasonal influx in summer (by water) and uniform consumption. There is only a change in the period of seasonal influx and the site of finding the reserve.

It should be noted that this technique of determining the production reserve is presented in relation to one object or region of concentration of work. When the construction organization has several regions with different variants of supply, the total size of the reserve of materials must be computed as the weighted average for the volume of consumption or the volume of construction-installation operations.

According to the stated technique which takes into consideration the features of the transportation plan for importing freight to the objects, a computation is made of the maximum reserve for the central Ob' region (Surgut, Nizhnevartovsk) and the gas extracting region (Urengoy, Nadym). With seasonal influx of materials by water and their uniform consumption, the standard for the production reserve for construction objects in the central Ob' region equals 210 days, and in the region of gas extraction 270 days. With seasonal influx by water, and further by winter road, as well as seasonal influx (in summer) and seasonal consumption (in winter), this standard is the same in both regions. Only in the first case it is 405 days and in the second 360. Finally, with regular influx and seasonal consumption (in winter)--240 and 180 days respectively.

These values can be used to establish the standard of production reserves for the construction organizations of the northern Tyumenskaya Oblast with regard for the specific weight of the objects that are supplied by a certain variant of reserve formation. Since the size of the seasonal reserve is determined by the duration of the navigational period and the period of operation of the winter road, that is, by natural-climate conditions, then one should not expect any signficant changes in the level of these indicators in the future. The standard for the production reserve on the whole for the construction organization will change depending on the specific weight of the objects whose supply or work are seasonal.

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